TASCAM
TEAC Professional Division

SERVICE MANUAL

238

SYNCASET

NOTES

As regards the resistors and capacitors, refer to the circuit diagrams and the PCB ass'y drawings contained in this manual.

* Parts marked with * require longer delivery time.
* Resistor values are in ohms (k = 1,000 ohms, M = 1,000,000 ohms).
* All capacitor values are in microfarads (p = picofarads).
* ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components – refer to the TEAC Parts List and ensure exact replacement.
* 0 dB is referenced to 1V in this manual unless otherwise specified.
* PC boards shown viewed from foil side.
* Parts not shown in the parts lists or parts, through listed, having no parts numbers are not general "ready-to-supply" parts.

注意

標準の抵抗：コンデンサーは省略してあります。回路図及び基板図を参照してください。

1．プリント基板図はパターン面が示されています。
2．＊印の部品は納期が若干かかります。あらかじめご了承ください。
3．⚠印は安全規格重要部品です。交換するときは必ずティアック指定の部品を使用して下さい。
4．レベルは0dB＝1Vを基準にしています。
5．コンデンサの単位はμF.p＝pF（1μF＝1,000,000pF）
6．製品が改善されているために、製品と回路図が一部異っている場合があります。
7．リストされていない部品は原則としてサービス供給部品として取扱っていません。

Effective: MAY, 1988 Q-840190

5704039810

1. SPECIFICATIONS
仕様

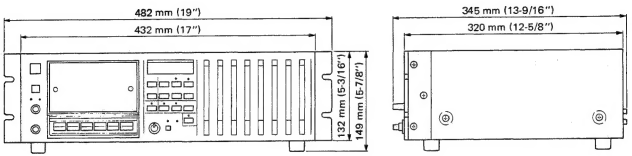
MECHANICAL CHARACTERISTICS	
Tape	Compact Cassette (C-30/60/90), Hi-bias, type II tape
Track Format	8-track, 8-channel, single directional record/play
Head Configuration	1 record/reproduce, tracks 1–4 and 5–8 staggered (sendust) 1 erase (ferrite)
Motor	1 FG servo DD capstan motor, 1 DC reel motor, 1 DC ancillary motor
Tape Speed	9.5 cm/sec (3-1/2 ips) ±0.5 %
Pitch Control	±12 %
Wow and Flutter	0.04 % WRMS (NAB weighted) ±0.08 % W.PEAK (DIN/CCIR/IEC/ANSI weighted)
Fast Winding Time	70 sec. (approx.) with C-60
Recording/Play Time	15 min. with C-60, pitch control off
Dimensions (W x H x D)	482 x 149 x 345 mm (19" x 5-7/8" x 13-9/16"), rack mount brackets, feet and other protruding parts included
Weight (net)	9.5 kg (20.94 lbs)
ELECTRICAL CHARACTERISTICS	
Line Input (x 8), Unbalanced	
Input Impedance	30 kohms
Nominal Input Level	–10 dBV (0.3 V)
Line Output (x 8), Unbalanced	
Output Impedance	100 ohms
Nominal Output Level	–10 dBV (0.3 V)
Record Channel	8 (dbx switchable per two groups of channels 1-4/5-8)
Playback Channel	8 (dbx switchable per two groups of channels 1-4/5-8)
Bias/Erase Frequency	85 kHz ±5 kHz
Equalization	3,180 μs + 35 μs
Power Requirements	
USA/CANADA	120 V AC 60 Hz
U.K./AUSTRALIA	240 V AC 50 Hz
GENERAL EXPORT	120/220/240 V AC 50/60 Hz
EUROPE	220 V AC 50 Hz
Power Consumption	47 Watts
PERFORMANCE CHARACTERISTICS	
Frequency Response (Overall)	30 Hz to 16 kHz ±3 dB
Signal-To-Noise Ratio (Overall)	93 dB (dbx* IN, IHF "A" weighted, 1 kHz)
(Ref. to 3 % THD)	90 dB (dbx IN, unweighted, 20 to 20,000 Hz) 58 dB (dbx OUT, IHF "A" weighted, 400 Hz) 54 dB (dbx OUT, unweighted, 20 to 20,000 Hz)
Distortion (THD)	Less than 0.8 % (400 Hz, 0 VU)
Crosstalk (Adjacent Channels)	70 dB (1 kHz, 0 VU, dbx IN)
Erasure	70 dB (1 kHz, +10 VU)

In these specifications, 0 dBV is referenced to 1.0 Volt. Actual voltage levels are also given in parenthesis. To calculate the 0 dB = 0.775 Volt reference level (i.e., 0 dBm in a 600-ohm circuit), add 2.2 dB to the listed dB value; i.e., –10 dB re: 1 V = –7.8 re: 0.775 V.

Changes in specifications and features may be made without notice or obligation.

* dbx is a registered trademark of dbx Incorporated.

● この仕様中の 0 dBV は 1.0 V を基準としています．実際の電圧も（　　）で示しています．
● 仕様及び外観は改善のため予告なく変更することがあります．



2. REMOVAL OF EXTERNAL COMPONENTS
外装部品の外し方

Disassemble in number-order
番号順に外して下さい

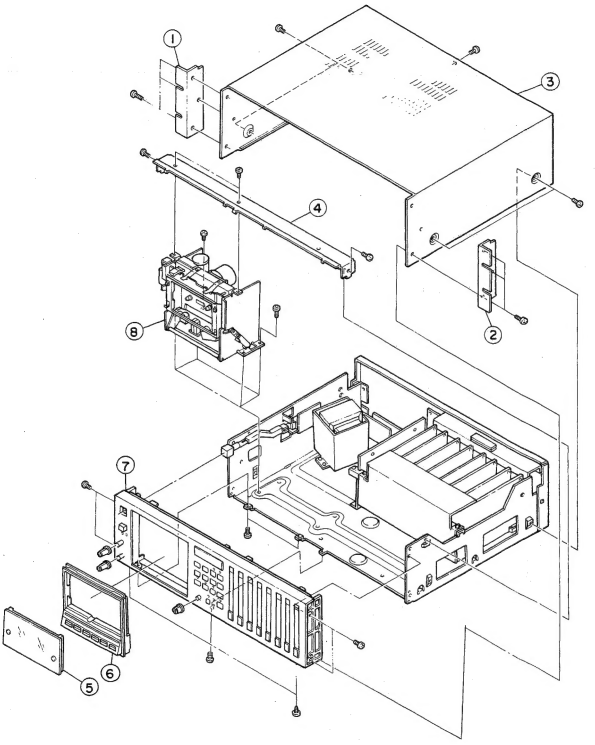
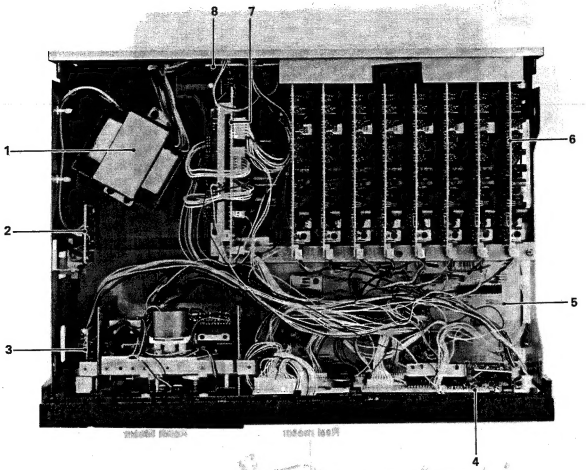


Fig. 2-1

3. PARTS LOCATIONS
部品配置図



1	POWER TRANSFORMER
2	POWER SW. PCB
3	PITCH CONTROL PCB
4	CONTROL PCB
5	MOTHER PCB
6	R/P PCB
7	POWER SUPPLY PCB
8	DBX SW PCB

Fig. 3-1 Top view 上面図

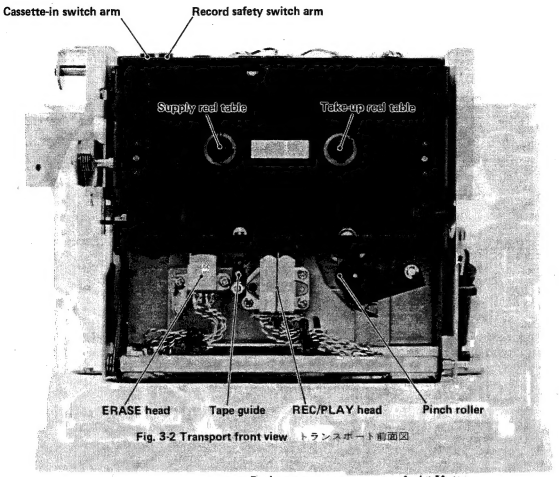


Fig. 3-2 Transport front view トランスポート前面図

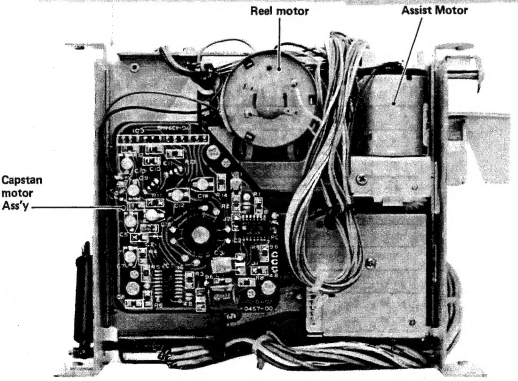


Fig. 3-3 Transport rear view トランスポート後面図

4. MECHANICAL CHECKS AND ADJUSTMENTS
機構部の確認と調整

4-1. TEST MATERIAL

1. **Cassette torque meter**
   - Sansei Rikoh model SRK-CT-W100, for supply torque cheks
     T.T. (Takeup Tension): 0 – 120 g. cm
     B.T. (Back Tension): 0 – 14 g. cm
   - Sony model TW-2231, for fast winding torque checks
     Measurement range: 0 – 200 g. cm
2. **Mirror tape**
   - TEAC MTT-902 (C-90), for tape travel checks
     (See Caution #2 in paragraph 4-3, page 8.)
3. **Performance test tape**
   - TEAC MXT-111, for tape speed and wow/flutter checks ("repro method")
     Signal contained: 3000 Hz/0 dB
   - TEAC MTT-5561 (blank tape, chrome), for wow/flutter checks ("rec/repro method")
   - TEAC MXT-1161, for azimuth and head touch (tape pressure against the heads) checks

4-2. PINCH ROLLER PRESSURE

1. Attach a string to the pinch roller and a spring scale to the string.
2. Push up the cassette switch (transport protection lever) shown in Fig. 3-2, then while holding the cassette switch up, press the PLAY button to engage the pinch roller and capstan shaft.
3. Slowly pull the spring scale against the pinch roller in the direction shown by the arrow in Fig. 4-1, until the pinch roller is fully apart from the capstan shaft, then slowly let the pulling force loose and
4. Note the reading on the spring scale when the pinch roller engages again with the capstan shaft and this starts rotating.
   Specification: 380 to 500 g

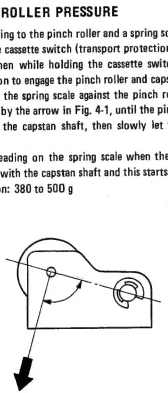


Fig. 4-1

4－1．テスト・テープ

1．カセット・トルク・メータ
- サンセイ理工製　SRK-CT-W100
  テイク・アップ，サプライ・トルク　チェック用
  T.T.: 0 ～120g・cm
  B.T.: 0 ～ 14g・cm
- ソニー製 TW-2231
  F.FWD.REW トルク　チェック用
  0 ～200g・cm

2．ミラー・テープ
- TEAC MTT-902　※4-3 項（注意.2）参照
  テープ・パス　チェック用
  C-90　タイプ

3．テスト・テープ
- TEAC MXT-111
  テープ・スピード　チェック用
  ワウ・フラッタ（再生法）チェック用
  信号レベル:3000Hz/0dB
- TEAC MTT-5561
  ワウ・フラッタ（録再法）チェック用
  クロム・タイプ，ブランク・テープ
- TEAC MXT-1161
  アジマス，ヘッド・タッチ　チェック用

4－2．ピンチ・ローラ圧着力

1．カセット・イン・スイッチ・アーム（図3-2)を上方に押して，プレイ・モードにする．測定中，スイッチ・アームは上方に押し続けること．
2．ピンチ・アームにバネ秤を掛ける．
3．ピンチ・ローラがキャプスタン・シャフトから完全に離れるように秤を矢印の方向（図4-1)に引張った後，ピンチ・ローラが再びキャプスタン・シャフトに接触するように徐々に戻す．
4．ピンチ・ローラが回り始めるときの値を読む．
   規格：380 ～500g

4-3. TAPE TRAVEL CHECKS AND ADJUSTMENTS

CAUTION 1: Upon replacement of the record/repro head and/or the erase head, loosely tigthen screws (A) – (G) (Fig. 4-2) then turn them one half back, before starting to perform the following steps. In addition, the procedures require the following materials:
Head adjustment jig "A" (Part no. 5736006600)
Head adjustment jig "B" (Part no. 5736006700)

4 – 3. テープ走行

注意. 1.録・再ヘッド及び消去ヘッドを交換したときには図4-2 のネジ(A) ～(G) を軽く締め切って，その位置からそれぞれのネジを1.5 回転緩めた状態で調整を始めること．又，この調整を行う為には次の治具が必要です．
ヘッド調整治具 A (P/N : 5736006600)
ヘッド調整治具 B (P/N : 5736006700)

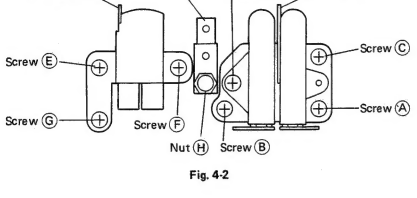
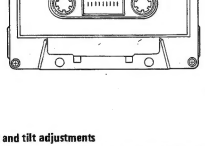


Fig. 4-2

CAUTION 2: The 238's 8-channel format head requires much more accuray in tape travel adjustments than any traditional heads. Be sure to use a new TEAC mirror tape which is more suitable to the 238 than the former type. Note that both share the same model name and part number though they differ in aspects as shown in Fig. 4-3.

2.本機の走行調整は 8トラック・ヘッドということで従来カセットに比べてより精度が必要です．そこで調整に必要なミラー・テープ TEAC MTT-902 に関しましては走行系をより精度アップした新タイプのものを必ず使用して下さい．
従来タイプと新タイプでは品番，品名が変わりませんので外観上の違いで区別して下さい．(図4-3 参照)

New Type　新タイプ



Former Type　旧タイプ

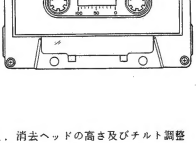


Fig. 4-3

1) Erase head height and tilt adjustments

1. Set jigs A and B as shown in Fig. 4-4, and put the deck into Play mode.
2. Adjust screw G until jig B touches the tape guide lower flange.
3. Apply jig B to the head as shown in Fig. 4-5, to check tilt. If necessary, adjust screws E and F *evenly* (until the head is flush with the jig). Rotational amount of both screws E and F should be the same and be limited within 1/8 turn.
4. Check again head height.
5. Repeat steps 2 to 4 until both height and tilt are correct at the same time.

1．消去ヘッドの高さ及びチルト調整

1)．ヘッド調整治具A，Bを図4-4 の様にセットしプレイ・モードにする．

2)．治具Bが消去ヘッドのテープ・ガイドの下側に当る様にネジGで高さを調整する．

3)．図4-5 の様に治具Bをヘッドに当てて，チルトを確認しヘッドが治具に対して垂直になる様に，ネジE，Fを同量(1/8回転以下) 回し調整する．

4)．再度，ヘッドの高さを確認する．

5)．高さ及びチルトが最適になるまで 2) ～4)項を繰り返す．

2) Tape guide height adjustment

6. Adjust nut H until jig B touches the tape guide upper flange.

3) Record/repro head height and tilt adjustments

7. Turn in and out the height adjustment screw C (Fig. 4-2) until jig B touches the tape guide lower flange.
8. Apply jig B to the head as shown in Fig. 4-5, to check tilt. If necessary, adjust screws A and B *evenly* (until the head is flush with the jig). Rotational amount of both screws A and B should be the same and be limited within 1/4 turn.
9. Check again head height.
10. Repeat steps 7 to 9 until both height and tilt are correct at the same time.

2．テープ・ガイドの高さ調整

6)．治具Bがテープ・ガイドの上側に当る様にナットHを回して調整する．

3．録・再ヘッドの高さ及びチルト調整

7)．治具Bがテープ・ガイドの下側に当る様にネジCで高さを調整する．

8)．図4-5 の様に治具Bをヘッドに当てて，チルトを確認しヘッドが治具 Bに対して垂直になる様にネジA，Bを同量(1/4回転以下) 回し調整する．

9)．再度，ヘッドの高さを確認する．

10)．高さ及びチルトが最適になるまで，7)～9)項を繰り返す．

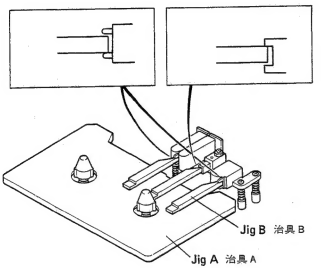


Fig. 4-4

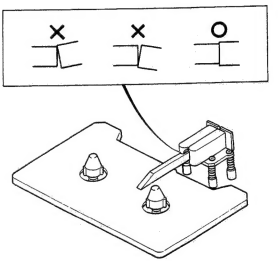


Fig. 4-5

4) Head azimuth adjustment

11. Refer to Fig. 4-6 and connect an oscilloscope with the channel 1 LINE OUT connected to the vertical input of the scope and the channel 4 LINE OUT connected to the horizontal input of the scope.

4．ヘッド・アジマス調整

11)．図4-6 の様に1CH のLINE OUTをオシロスコープのVER 側に，4CH のLINE OUTをオシロスコープのHOR 側に接続する．

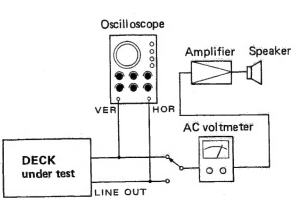


Figure shows measurements being performed on Ch-1 and Ch-4.

Fig. 4-6 Test setup for azimuth check 位相測定接続図

12. Load a test tape TEAC MXT-1161.
13. Play the 315-Hz signal on the tape then the 6.3-kHz signal, to check that the outputs from channels 1 and 4 are in phase as seen on the scope. If necessary, adjust screw B (Fig. 4-2).

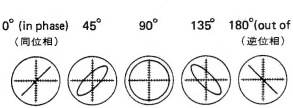


Fig. 4-7 Confirming phase relationship 位相

5) Tape travel check

14. Run a mirror tape TEAC MTT-902 and adjust screw C until the running tape rubs on the rec/repro head's tape guide lower flange. Also, check for erase head and tape parallelism (approximate). If necessary, adjust screw F.
When the F screw is adjusted, be sure to recheck for correct height and tilt of the erase head.

6) Head touch (tape pressure against the head)

15. Load a test tape TEAC MXT-1161.
16. Play the 10-kHz signal on the tape, and check that the output level from channels 1 and 8 does not vary beyond the limit of 0.2 dB when back tension is varied by repeatedly applying a slight finger pressure to the left reel.
17. If either of the output levels varies, turn both A and B screws by the same amount (within 1/4 turn), clockwise to remove level variation from the channel 1 output, and counterclockwise to remove level variation from the channel 8 output, then adjust screw C as in step 5.
18. Recheck for no level variation. Repeat steps 16 and 17 until there is no level variation.
19. Recheck azimuth, tape travel, and head touch (from step 11 on). (This is necessary only when serews A and B were moved in step 17.)

7) Head azimuth fine adjustment

20. Play the 315-Hz signal and 6.3 kHz signal on the TEAC MXT-1161 test tape, and adjust screw D until there is no phase difference between channels 5 and 8.

8) Tape travel final check

21. Run the mirror tape, TEAC MTT-902, and check that the tape is running as shown in Fig. 4-8, that is, touching (but without causing curling) the tape guide lower flange of both the erase and record/reproduce heads and the upper flange of the tape guide pin.
Check also to make sure that tape motion is not affected when the run and stop of tape is repeatedly operated.

12). テスト・テープ TEAC MXT-1161を装填する．
13). プレイ・モードにて 315Hzと 6.3kHz を再生したとき 1CH と 4CHの位相を合わせる様にネジBを回して調整する．（図4-7 参照）

5．走行調整

14). ミラー・テープ TEAC MTT-902 を走行させ，録・再ヘッドのテープ・ガイド下側にテープが当る様にネジCで調整する．又，消去ヘッドとテープがほぼ平行であることを確認し，傾いている場合にはネジFを回して調整する．ネジFを調整した場合は，高さ及びチルトを再調整する．

6．ヘッド・タッチ

15). テスト・テープ TEAC MXT-1161を装填し，プレイ・モードでテープを走行させる．
16). 10kHz を再生し，左リールを軽く手で押さえたり，離したりしてバック・テンションを変え1CH 及び8CH のレベルが変化しない（0.2dB 以下）ことを確認する．
17). もし，どちらか一方のCHのレベルが変動するようであればネジA，Bを同量(1/4回転以下) 回し(1CHがレベル変動する場合にはネジを締める様に，8CHがレベル変動する場合にはネジを緩める様に回す．)，5 項（走行調整）の要領でネジCを調整する．
18). 再度レベル変動を確認し，レベル変動が無くなるまで17) 項を繰り返す．
19). ネジA，Bを調整した場合には必ず，4 項（アジマス調整）に戻り，再度それ以後の項目を繰り返す．

7．ヘッド・アジマス微調整

20). テスト・テープ TEAC MXT-1161の 315Hzと 6.3kHz を再生したとき，5CH と 8CHの位相を合わせる様にネジDを回して調整する．

8．テープ走行確認

21). ミラー・テープ TEAC MTT-902 を走行させ，図4-8 の様にテープが消去ヘッド及び録・再ヘッドのテープ・ガイド下側，テープ・ガイド上側に当り，かつテープのカールが無いことをストップ，プレイを繰返し確認する．

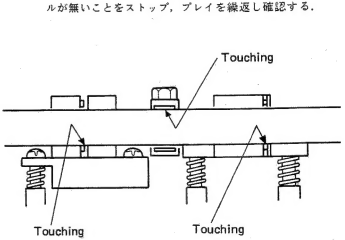


Fig. 4-8

4-4. REEL TORQUE

1) Takeup Torque and Back tension

1. Mount a cassette torque meter (SRK-CT-W100), put the deck into Play mode, and note the readings on the torque meter. If reading fluctuates, get the mean value. Readings (or mean values) should be as follows:
   Takeup torque (left reel table): 25 to 65 g. cm
   Back tension (right reel table): 12 to 16 g. cm
2. If back tension is not within the limits, adjust semi-fixed resistor R33 on the Control PCB (Fig. 4-9) until the torque meter reads 14 g ± 1 g.

Fig. 4-9

2) Fast Winding Torque

3. Mount a cassette torque meter TW-2231 and check its reading while in F.FWD and REW. Readings should be as follows:
   Fast forwarding torque (right reel table): 80 to 180 g. cm
   Rewinding torque (left reel table): 80 to 180 g. cm

4-5. TAPE SPEED

CAUTION: After replacement of the castan motor assembly, be sure to short-circuit (by soldering) the points on the assembly shown by the arrow in Fig. 4-10. Otherwise, correct tape speed adjustments are not ensured.

1. Connect a frequency counter to LINE OUT of any channel.
2. Set the Pitch Control Switch to FIX.
3. Switch power on.
4. Load test tape TEAC MXT-111 and let it run in Play mode for at least 1 minute, to allow the capstan motor to warm up.
5. Play the middle portion of the test tape, and adjust semi-fixed resistor VR1 on the capstan motor assembly (Fig. 4-10) until the counter reads 3000 Hz ± 5 Hz.

4－4．リール・トルク

1．テイク・アップ・トルク，バック・テンション

1)．カセット・トルク・メータ(SRK-CT-W100) を装填後，プレイ・モードにしトルク・メータの値を読む．振れのある場合は中心値とする．規定値は次の通りです．
テイク・アップ・トルク（右リール台）：25～65g.cm
バック・テンション（左リール台）：12～16g.cm

2)．もしバック・テンションが上記値より外れている場合には，バック・テンションの値が 14g±1gになる様にコントロール PCBの半固定抵抗 R33 (図4-9)を回して調整する．

2．F.FWD，REW トルク

カセット・トルク・メータ(TW-2231) を装填し，F.F.動作及びREW 動作の起動トルクをそれぞれ測定する．
規定値は次の通りです．
F.FWDトルク（右リール台）：80～180g.cm
REWトルク（左リール台）：80～180g.cm

4－5．テープ速度

注意：キャプスタン・モータ ASS'Yを交換した場合は，キャプスタン・モータ ASS'Yの基板上，図4-10の矢印で示した場所を半田ショートして下さい．この場所がショートされていないと正常なテープ・スピードが得られません．

1．周波数カウンタを LINE OUT ジャックのいずれかに接続する．
2．ピッチ・コントロール・スイッチを FIXにする．
3．POWER スイッチをオンにする．
4．キャプスタン・モータを回転させウォーミング・アップする為に TEAC MXT-111 を装填し，少なくとも 1分間そのままにしておく．
5．テスト・テープの中間部を再生させて，テープ速度が3000Hz±5Hz になるようにキャプスタン・モーターASSYの半固定抵抗 VR1 (図4-10) を調整する．

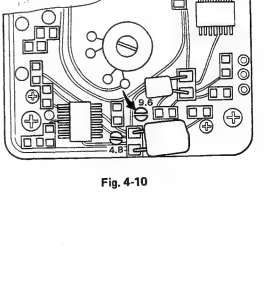


Fig. 4-10

6. After adjustment, check for the following values at both the beginning and end of tape.
   Deviation: 3000 Hz ± 5 Hz
   Accuracy: 10 Hz
7. Set the Pitch Control Switch to VARI.
8. Set the Pitch Control to its center position, play the middle portion of the test tape and adjust semi-fixed resistor R14 on the Pitch Control Switch Assembly (Fig. 4-11) until the frequency counter reads 3000 Hz ± 5 Hz.
9. Set the Pitch Control to minimum then to maximum, to check for the following values:
   Minimum speed (control fully turned counterclockwise): less than 2640 Hz
   Maximum speed (fully clockwise rotation): more than 3360 Hz
10. Set the Pitch Control Switch to EXT, and short-circuit between pins 13 and 14 of the rear panel ACCESSORY terminal (D-sub connector).
11. Play the test tape and adjust semi-fixed resistor R5 on the Pitch Control Switch Assembly (Fig. 4-11), until the counter reads 3000 Hz ± 5 Hz.

6. 調整後，テープの巻き始めと巻き終わりにて下記の値が得られるか確認する．
   速度偏差：3000Hz±5Hz
   変動幅　：10Hz
7. ピッチ・コントロール・スイッチを VARI にする．
8. ピッチ・コントロールをセンターに合わせ，テスト・テープの中間部を再生し，周波数カウンタが 3000Hz ±5Hz を示すようにピッチ・コントロール・スイッチ PCBの半固定抵抗 R14 (図4-11) を回して調整する．
9. ピッチ・コントロールを最少，最大に回して下記の値が得られるか確認する．
   最少：充分反時計方向にセットして 2640Hz 以下
   最大：充分時計方向にセットして 3360Hz 以上
10. ピッチ・コントロール・スイッチを EXTにし，リア・パネルのアクセサリー端子 (D-SUB ・コネクタ) の 13 ピンと 14 ピンをショートする．
11. テスト・テープを再生し，周波数カウンタが 3000Hz ±5Hz を示す様にピッチ・コントロール・スイッチ PCBの半固定抵抗 R5(図4-11) を回して調整する．

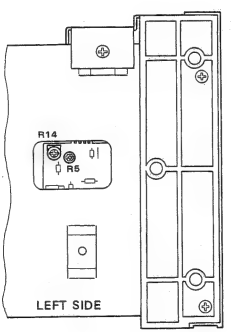


Fig. 4-11

4-6. WOW/FLUTTER

CAUTION: Measurement need be repeated at three tape locations: (1) when the tape is playing its beginning (after tape pack on the right hub diminishes one mark on the scale on the cassette), (2) when the tape is playing its middle portion, and (3) when the tape nears its end (before tape pack on the left hub diminishes past the last, innermost mark on the cassette scale).

Repro method:

1. Connect a wow/flutter meter to the deck as shown in Fig. 4-12.

4－6．ワウ・フラッタ

注意：測定はテープの巻き始め，中間部，巻き終わりでそれぞれ行なってください．(但しハーフの巻き始めと巻き終わりの1 目盛りを除く．)

再生法．

1．図4-12の様にワウ・フラッタ・メータをデッキに接続する．

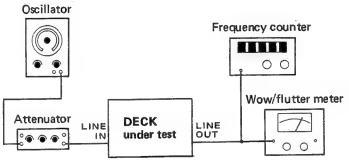


Fig. 4-12

2. Load a test tape TEAC MXT-111 or equivalent and run it in Play.
3. Note the reading on the meter.
   Specification: less than 0.08 % WRMS (weighted)

Record/repro method:

4. Load a blank test tape TEAC MTT-5561 or equivalent, and record a 3000 Hz signal on it.
5. Play the recording.
6. Note the reading on the meter.
   Specification: less than 0.3 % RMS (not weighted)

2．テスト・テープ TEAC MXT-111 または相当品を装填し再生する．

3．ワウ・フラッタ値を測定する．
   規格：0.08%WRMS 以下（聴感補正値）

録再法．

4．ブランク・テスト・テープ TEAC MTT-5561または相当品を装填し，3000Hzを録音する．

5．録音した部分を巻き戻して再生する．

6．ワウ・フラッタ値を測定する．
   規格：0.3%RMS 以下（非聴感補正値）

5. AMPLIFIER SECTION CHECKS AND ADJUSTMENTS
アンプ部の確認と調整

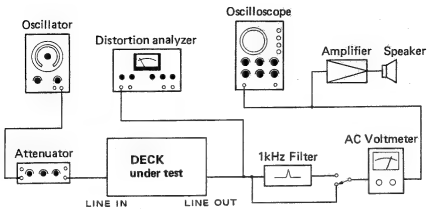


Fig. 5-1 Basic test setup 基本測定接続図

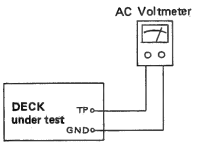


Fig. 5-2 Connections for steps 5-4-1 and 5-4-2
5-4-1及び5-4-2項の場合の接続

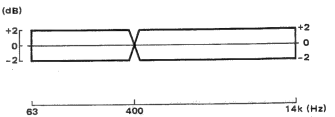


Fig. 5-4 Monitor frequency response
モニター周波数特性

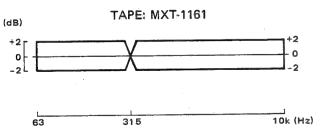


Fig. 5-3 Playback frequency response
再生周波数特性

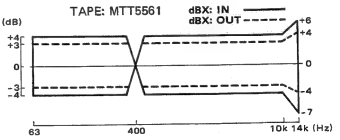
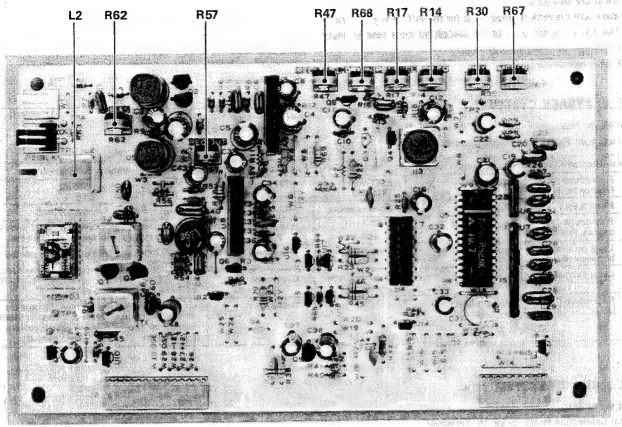


Fig. 5-5 Overall frequency response
録再周波数特性



R14	Playback equalizer	再生イコライザ
R17	Playback reference level	再生基準レベル
R30	DBX Timing	DBXタイミング
R47	Record Reference level (without DBX)	録音基準レベル(DBX OUT)
R57	Sync crosstalk	シンク・クロストーク
R62	Bias	バイアス
R67	Meter level	メータ・レベル
R68	Record reference level (with DBX)	録音基準レベル(DBX IN)
L2	Bias amp	バイアス・アンプ

Fig. 5-6 Adjustment and test point locations (R/P PCB)

5-1. PRECAUTIONS

1. Before performing adjustments or checks, clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your area.
3. The AC voltmeter used in the procedures must have an input impedance of 1 megaohm or more.
4. 0 dB is referenced to 1 V.

5-2. PLAYBACK SYSTEM

Test Mode: Play
Measurement Point: LINE OUT Terminal

Adjustment Item	Preliminary	Input Signal	Adjustment Point	Measurement Point/Spec.
1. Reproduce Reference Level	Connection as in Fig. 5-1	MXT-1161 (315 Hz)	R17 (every ch.)	-10 dB (every ch.)
2. Meter Level	Same as above	Same as above	R67 (every ch.)	0 dB on the meter (every channel)
3. Reproduce Frequency Response	Same as above	MXT-1161	R14 (every ch.)	Spec. shown in Fig. 5-3 (adjust until level at 10 kHz is 0dB: same level as at 315 kHz)
4. Level difference between channels	Same as above	Same as above	Check only	40 – 6.3 kHz within 3 dB (every channel)
5. Level fluctuation	Same as above	Same as above	Check only	40 – 6.3 kHz within 2 dB/6.3 k – 12.5 kHz within 3 dB (every channel)
6. Reproduce S/N ratio	Same as above	–	Check only	47 dB or more (every channel; Exception: 45 dB or more for channels 1 and 8): Readings when "reproducing" leader tape with the deck set for nominal level output.

5-3. MONITOR SYSTEM

Test Mode: Stop
Signal Connection Point: LINE IN Terminal
Measurement Point: LINE OUT Terminal

Adjustment Item	Preliminary	Input Signal	Adjustment Point	Measurement Point/Spec.	Others
1. Input level	Connection as in Fig. 5-1 RECORD FUNCTION SW. set to ON	400 Hz/–10 dB (nominal input) (every channel)	Check only	–10 dB ±1 dB (every channel)	Peak meter reading: 0 dB ± 1 dB
2. Monitor Frequency Response	Same as above	63 – 14 kHz/–10 dB (every ch.)	Check only	Spec. shown in Fig. 5-4.	
3. TAPE SYNC	Same as above Besides: TAPE SYNC Sw. set to IN	400 Hz/–10 dB (channel 8)	Check only	Check for variation of ∞ to –4 dB ± 1 dB in output level as the rear panel LEVEL pot is turned. Thereafter set the pot for –10 dB.	
4. Monitor S/N	Connection as in Fig. 5-1 RECORD FUNCTION Sw. set to ON	No sig. connected	Check only	60 dB or more (every ch.)	Reference –10 dB

5-4. RECORD SYSTEM

Test Mode: RECORD/PLAY (unless otherwise specified)
Signal Connection Point: LINE IN Terminal
Measurement Point: LINE OUT Terminal (unless otherwise specified)

Adjustment Item	Preliminary	Input Signal	Adjustment Point	Measurement Point/Spec.
1. Bias Amp.	Connection as shown in Fig. 5-2 RECORD FUNCTION Sw. set to ON, and Transport to RECORD/PAUSE	—	L2 (every channel)	Adjust for minimum DC voltage between TP5-TP6
2. dbx Timing	Same as above	—	R30 (every channel)	Adjust for 18.4 mV DC voltage between TP1-TP2.
3. Bias Set	Connect. as in Fig. 5-1 DBX NRs set to IN	–30 dB (–20 dB with respect to nominal input)	R62 (every channel)	Adjust for same level at 1 kHz and 10 kHz.
4. Record reference level setting (without DBX)	Same as above Except: DBX NRs set to OUT	400 Hz/–10 dB (nominal input)	R47 (every channel)	Adjust for nominal level of –10 dB ± 1 dB in reproduce.
5. Record Distorsion	Same as above	Same as above	Check only	2 % or less (every channel)
6. Record Reference Level Setting (with DBX)	Same as above Except: DBX NRs set to IN	Same as above	R68 (every channel)	Adjust for nominal level of –10 dB ± 1 dB in Reproduce.
7. Record Frequency Response	Same as above DBX NRs set to IN and OUT alternately	63 — 14 kHz/–30 dB (–20 dB with respect to nominal input level)	Check only	Specifications shown in Fig. 5-5 (every channel)
8. Level Difference between Channels	Same as above Besides: DBX NRs set to OUT	Same as above	Check only	Within 2 dB for 400 Hz, within 3 dB for 63 Hz to 6.3 kHz, within 4 dB for 6.3 kHz to 10 kHz (all within the limits of record/reproduce frequency response)
9. Record/Reproduce Level Fluctuation	Same as above	Same as above	Check only	Within 1 dB for 400 Hz, within 2 dB for 63 to 6.3 kHz, within 3 dB for 6.3 kHz to 14 kHz (all within the limits of record/reproduce frequency response)
10. Sync Mode Crosstalk	Connection as shown in Fig. 5-1 RECORD FUNCTION Sw. of channel being tested set to ON (all others disengaged)	14 kHz/–10 dB	R57 (every channel)	Adjust for minimum leakage from recording channel onto the adjacent channels.
11. Track Crosstalk	Same as above, Besides: RECORD FUNCTION Sw. of all channels set to ON	125 Hz/–10 dB into channels 1 to 4 (no signal connected to channels 5 to 8)	Check only	Calculate the difference of output level between from channels 1 to 4 and channels 5 to 8. Spec.: 30 dB or more. Repeat measurement connecting no signal to channels 1 to 4 and the 125 Hz/–10 dB signal to channels 5 to 8.
12. Channel Separation	Connection as shown in Fig. 5-1 (with a 1 kHz band pass filter inserted)	1 kHz/–10 dB into channels 1 and 3, no signal into the remaining channels	Check only	Calculate the difference of output level between from channels 1 and 3 and channels 2 and 4. Spec.: more than 35 dB Repeat procedures for the following pairs of channels: 2 and 4 → 1 and 3 5 and 7 → 6 and 8 6 and 8 → 5 and 7 (no signal ch.)
13. Cross Erasure	Connection shown as in Fig. 5-1	10 kHz/–10 dB into channels 1 to 4, no signal into channels 5 to 8	Check only	Within 1.5 dB: Record through channels 1 to 4, then reproduce the recording and note the output level. Then, erase tracks 5 to 8 to check to see that the output level from channels 1 to 4 drops by the specified level (within 1.5 dB)
14. Erasure	Connection shown as in Fig. 5-1 (with a 1 kHz band pass filter inserted)	1 kHz/0 dB (+10 dB with respect to nominal level)	Check only	65 dB or more: Reproduce the recording and measure output level, then erase the recording and reproduce the erased portion to measure again the output level. Compare this against the previous reading.
15. Record/Reproduce S/N Ratio	Connection shown as in Fig. 5-1 DBX NRs set to OUT	400 Hz/–10 dB thereafter no signal	Check only	45 dB or more (Exception: 43 dB or more as for channels 1 & 8): Difference between the 400 Hz recording and the no-signal portion.

5-1 注意

1．アンプ部の調整の前に，消去ヘッド，録／再ヘッド，テープ走行部分それぞれを充分消磁し，クリーナ液で清掃して下さい。
2．レベル計は入力インピーダンス１ＭΩ以上のものを使用して下さい。
3．0dB＝1V
4．ブランク・テープはTEAC MTT-5561又は，相当品を使用して下さい。

5-2 再生系

モード：PLAY
測定個所：LINE OUT端子

調整項目	準備・設定	入力信号	調整個所	測定個所・調整値	備考
1．再生基準レベル	接続：Fig5-1参照	MXT-1161 (315Hz/基準レベル区分)	各ch：R17	各ch：－10dB	
2．メータ・レベル	同上	同上	各ch：R67	各ch：メータ指示 0dB	
3．再生周波数特性	同上	MXT-1161	各ch：R14	各ch：規格Fig5-3 10kHzのレベルが0dB(315Hzと同レベル)になるように調整	
4．チャネル間レベル差	同上	同上	チェック	各ch：40～6.3kHz：3dB以内	
5．レベル変動	同上	同上	チェック	各ch：40～6.3kHz：2dB以内 6.3～12.5kHz：3dB以内	
6．再生S／N	同上	―――	チェック	規準出力状態でリーダ・テープ部を再生したときの値 各ch：47dB以上 (但し，1,8chは45dB以上)	

5-3 モニタ系

モード：STOP
信号入力箇所：LINE IN端子
測定箇所：LINE OUT端子

調整項目	準備・設定	入力信号	調整個所	測定個所・調整値	備考
1．INPUT 入力レベル	接続：Fig5-1参照 REC FUNCTION SW:ON	各ch：400Hz/－10dB (基準入力)	チェック	各ch：－10dB±1dB	メータの指示： 0dB±1dB
2．モニタ 周波数特性	同上	各ch： 63～14kHz/－10dB	チェック	各ch：規格Fig5-4	
3．TAPE SYNC	同上 リアパネル"TAPE SYNC SW"：IN	8ch： 400Hz/－10dB	チェック	ch8： リアパネル"LEVEL"ボリュームを回したときOUT PUTレベルが～－－4dB±1dB変化すること。確認後－10dBにセットする。	
4．モニター S/N	接続：Fig5-1参照 REC FUNTION SW：ON	無信号	チェック	各ch：60dB以上	基準レベルは －10dB

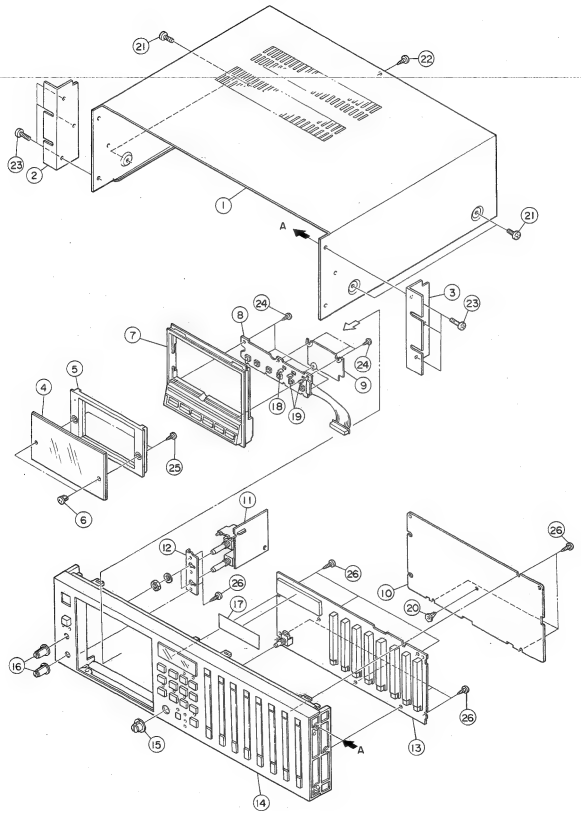
5-4 録音系

モード：REC/PLAY(特に指示のある場合を除く)
信号入力個所：LINE IN端子
測定個所：LINE OUT端子(特に指示のある場合を除く)

調整項目	準備・設定	入力信号	調整個所	測定個所・調整値	備考
1．バイアス・アンプ	接続：Fig5-2 REC FUNCTION SW:ON モード：REC/PAUSE	———	各ch：L2	TP5-TP6間の直流電圧が最小になるように調整	
2．dBXタイミング	同 上	———	各ch：R30	TP1-TP2間の直流電圧が18.4mVになるように調整	
3．バイアス・セット	接続：Fig5-1 dB×NR：IN	−30dB (基準入力に対して−20dB)	各ch：R62	1kHzと10kHzが同レベルになるように調整する	
4．録音基準 レベルセット (dbx:OUT)	同 上 dB×NR：OUT	400Hz/−10dB (基準入力)	各ch：R47	再生したとき基準出力 −10dB±1dBが出るように調整	
5．録音歪率	同 上	同 上	チェック	各ch：2%以下	
6．録音基準 (dbx:IN)	同 上 db×NR：IN	同 上	各ch：R68	再生したとき基準出力−10dB±1dBがでるように調整	
7．録音周波数特性	同 上 db×NR：IN,OUT	63〜14kHz/−30dB (基準入力に対して−20dB)	チェック	各ch：規格Fig.5-5	
8．チャネル間 レベル差	同 上 db×NR：OUT	同 上	チェック	録再周波数特性規格内に於けるch間レベル差 400Hz：2dB以内 63〜6.3kHz：3dB以内 6.3K〜10kHz：4dB以内	
9．録再 レベル変動	同 上	同 上	チェック	録再周波数特性規格内に於けるレベル変動 400Hz：1dB以内 63〜6.3kHz：2dB以内 6.3K〜14kHz：3dB以内	
10．シンク・ クロストーク	接続：Fig.5-1 REC FUNCTION SW： 調整chのみ：ON 他ch：OFF	14kHz/−10dB	各ch：R57	録音chから隣接再生chへの漏れが最小になるように調整する	
11．トラック間 クロストーク	同 上 REC FUNCTION SW： 全ch：ON	1〜4ch：125Hz/−10dB 5〜8ch：無信号	チェック	1〜4chの再生出力と5〜8chの再生出力の差：30dB以上 以下1〜4ch：無信号 5〜8ch：125Hz/−10dB の場合も同様に測定する。	
12．チャネル・ セパレーション	接続：Fig.5-1 (1kHz B.P.F使用) REC FUNCTION SW： 全ch：ON	1,3ch：1kHz/−10dB 他ch：無信号	チェック	1,3chの再生出力と2,4chの再生出力の差：35dB以上 以下2,4ch→1,3ch 5,7ch→6,8ch 6,8ch→5,7ch の場合も同様に測定する。	
13．クロス消去	接続：Fig.5-1	1〜4ch：10kHz/−10dB 5〜8ch：無信号	チェック	1〜4chを録音，再生したときのレベルを確認後，5〜8chを消去したとき，1〜4chの再生レベルの低下： 1.5dB以内	
14．消去率	接続：Fig.5-1 (1kHz B.P.F使用)	1kHz/0dB (基準レベルに対し＋10dB)	チェック	録音部分を再生した時のレベルを基準レベルとし，録音部分を消去しそれを再生した時の出力レベルとの差： 65dB以上	
15．録再S/N	接続：Fig.5-1 dB×NR：OUT	400Hz/−10dB ↓ 無信号	チェック	400Hz録再出力と無信号録再出力との差： 45dB以上 (但し，1．8chは，43dB以上)	

6. EXPLODED VIEWS AND PARTS LIST
分解図とパーツ・リスト

EXPLODED VIEW – 1



EXPLODED VIEW-1

Parts marked with *require longer delivery time.

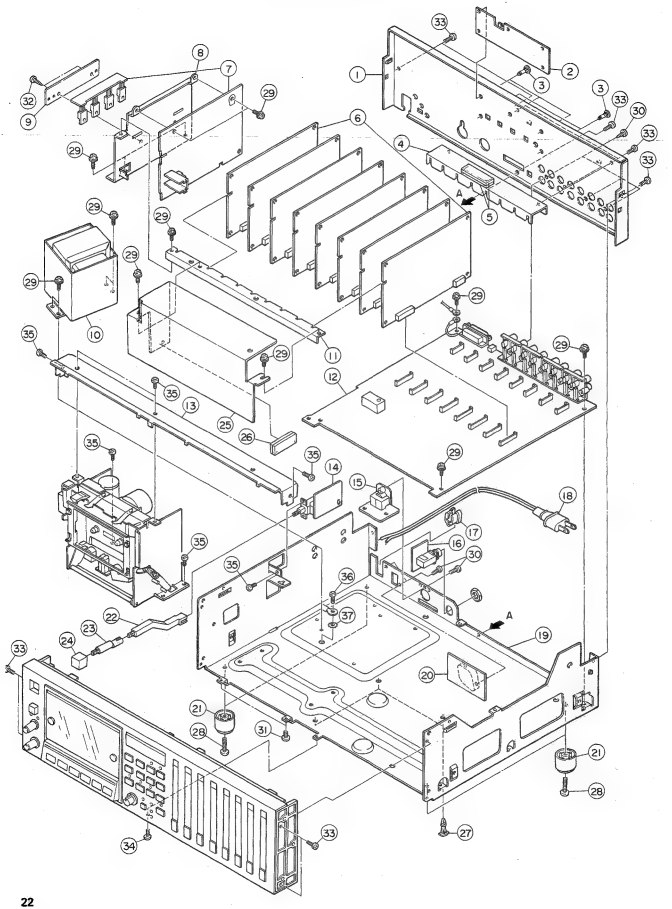
REF.NO.	PART NO.	DESCRIPTION	REMARKS
1- 1	*5801088900	BONNET	
1- 2	*5801088100	ANGLE;L	
1- 3	*5801088200	ANGLE;R	
1- 4	5800471701	COVER,CASSETTE	
1- 5	*5800122500	COVER,CASSETTE;2	
1- 6	*5800116800	BUSHING	
1- 7	*5800827202	ESCUTCHEON ASSY,CASSET	
1- 8	*5200250700	OP SW PCB ASSY	Refer to pages 31 & 33
1- 9	*5801116600	PLATE,SHIELD;A	
1-10	*5200250200	CONTROL PCB ASSY	Refer to pages 30 & 32
1-11	*5200250500	PITCH CONTROL PCB ASSY	Refer to pages 30 & 32
1-12	*5801087300	BRACKET,VR	
1-13	*5200250300	METER PCB ASSY	Refer to pages 30 & 32
1-14	*5801088500	PANEL ASSY,FRONT	
	*5801087500	PANEL,FRONT	
	*5801089100	SUB PANEL	
	*5801088000	BUTTON,CONTROL	
	*5801087800	COVER,COUNTER	
	*5801087900	COVER,METER	
	*5800827800	BUTTON,P	
	*5801087600	ROD,EJECT	
	*5801087700	SPRING,EJECT	
	*5786011300	E-RING;E-2.5	
	*5783543008	SCREW,BINDING P-TITE;M3X8(BLK NI)	
1-15	5801098600	KNOB ASSY	
1-16	5800961600	KNOB ASSY,VR	
1-17	*5801116800	FILTER,FL	
1-18	5225021300	LED,SLB25MG3F	
1-19	5225021200	LED,SLB25VR3F	
1-20	*5787040600	SUPPORT,PCB;KGTS-6N	
1-21	*5800612400	SCREW,M3X8 (BLK)	
1-22	*5783613008	SCREW,C-TITE;M3X8(BLK NI)	
1-23	*5780024012	SCREW,BINDING HEAD(BLK NI)	
1-24	*5783602006	SCREW,BINDING P-TITE;M2X6	
1-25	*5781112606	SCREW,BINDING TAPING;M2.6X6	
1-26	*5783603008	SCREW,BINDING P-TITE;M3X8	

INCLUDED ACCESORIES

REF.NO.	PART NO.	DESCRIPTION	REMARKS
	*5700104400	OWNER'S MANUAL [J]	
	*5700104500	OWNER'S MANUAL [EXCEPT J]	
	*5700104600	OWNER'S MANUAL [C,E]	
	*5780315015	SCREW,OVAL COUNTERSUNK;M5X15(NI)	
	*5544995000	WASHER	
	*5785225000	WASHER,FIBER;5X10X0.5T(BLK)	

[J]:JAPAN [US]:U.S.A. [E]:EUROPE [GE]:GENERAL EXPORT
[C]:CANADA [A]:AUSTRALIA [UK]:U.K.

EXPLODED VIEW – 2



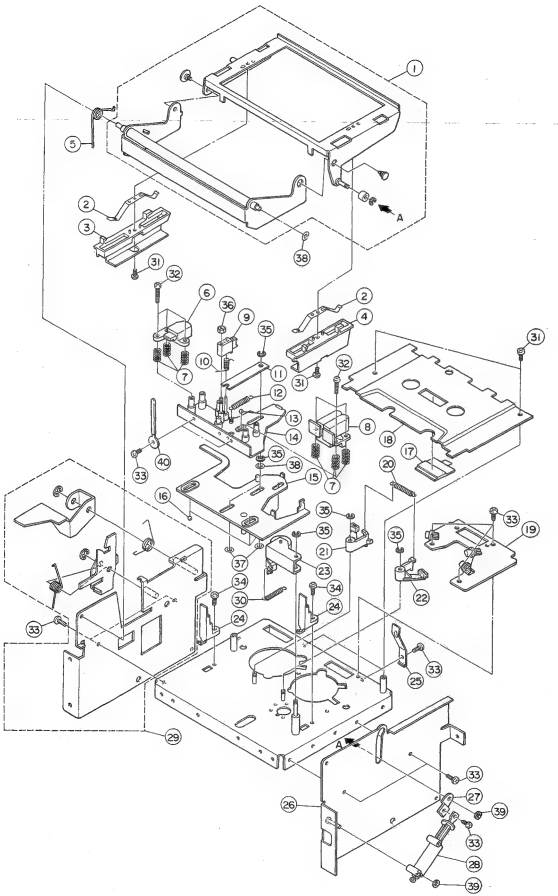
EXPLODED VIEW-2

Parts marked with *require longer delivery time.

REF.NO.	PART NO.	DESCRIPTION	REMARKS
2- 1	*5801088600	PANEL,REAR	
2- 2	*5200251500	DBX SW PCB ASSY	Refer to pages 31 & 33
2- 3	*5787033000	SUPPORT,PCB;KGLS-10R	
2- 4	*5801088400	PLATE,PCB PRESSURE;B	
2- 5	*5800999701	CUSHION	
2- 6	*5200251201	R/P AMP PCB ASSY	Refer to pages 28 & 32
2- 7	*5200250400	POWER SUPPLY PCB ASSY [J,US,C,GE]	Refer to pages 30 & 33
	*5200250410	POWER SUPPLY PCB ASSY [E,UK,A]	Refer to pages 30 & 33
2- 8	*5801088700	HEAT SINK	
2- 9	*5801098400	PLATE,PRESSURE [E,UK,A]	
2-10	⚠ 5320049700	TRANSFORMER,POWER [J]	
	⚠ 5320049800	TRANSFORMER,POWER [US,C]	
	⚠ 5320049900	TRANSFORMER,POWER [GE]	
	⚠ 5320050000	TRANSFORMER,POWER [E,UK,A]	
2-11	*5801088300	PLATE,PCB PRESSURE;A	
2-12	*5200251301	MOTHER PCB ASSY	Refer to pages 29 & 32
2-13	*5801088800	BRACKET,MECHANISM	
2-14	*5200250100	POWER SW PCB ASSY [J,US,C,GE]	Refer to pages 31 & 33
	*5200250110	POWER SW PCB ASSY [E,UK,A]	Refer to pages 31 & 33
2-15	*5200250000	REMOTE PCB ASSY	Refer to pages 31 & 33
2-16	*5200251400	PUNCH IN/OUT PCB ASSY	Refer to pages 31 & 33
2-17	⚠*5317003400	BUSHING;2271 [EXCEPT C]	
	⚠*5317005600	BUSHING;2272 [C]	
2-18	⚠*5128027000	CORD,AC [J]	
	⚠*5350008100	CORD,AC [C]	
	⚠*5350010700	CORD,AC [US]	
	⚠*5350010800	CORD,AC [GE]	
	⚠*5350011700	CORD,AC [E]	
	⚠*5128047000	CORD,AC [UK]	
	⚠*5350008300	CORD,AC [A]	
2-19		CHASSIS,MAIN	
2-20	*5200251900	SELECTOR PCB ASSY [GE]	Refer to pages 31 & 33
2-21	*5504676000	FOOT	
2-22	*5800968900	ROD,JOINT	
2-23	*5800116200	ROD,A	
2-24	5800173100	BUTTON,POWER	
2-25	*5801116700	PLATE,SHIELD;B	
2-26	*5800349800	CUSHION;A	
2-27	*5787005200	SUPPORT,PCB;LSR-10R	
2-28	*5783004018	SCREW,PAN S-TITE;M4X18	
2-29	*5783073006	SCREW,PAN S-TITE CUP;M3X6	
2-30	*5783543008	SCREW,BINDING P-TITE;M3X8(BLK NI)	
2-31	*5780002606	SCREW,BINDING HEAD;M2.6X6	
2-32	*5783603012	SCREW,BINDING P-TITE;M3X12	
2-33	*5783693006	SCREW,BINDING S-TITE;M3X6(BLK NI)	
2-34	*5783613008	SCREW,C-TITE;M3X8(BLK NI)	
2-35	*5783033005	SCREW,BINDING S-TITE;M3X5	
2-36	*5783004006	SCREW,PAN S-TITE;4X6 [C]	
2-37	*5785124000	LOCK WASHER;4.0T [C]	

[J]:JAPAN [US]:U.S.A. [E]:EUROPE [GE]:GENERAL EXPORT
[C]:CANADA [A]:AUSTRALIA [UK]:U.K.

EXPLODED VIEW – 3

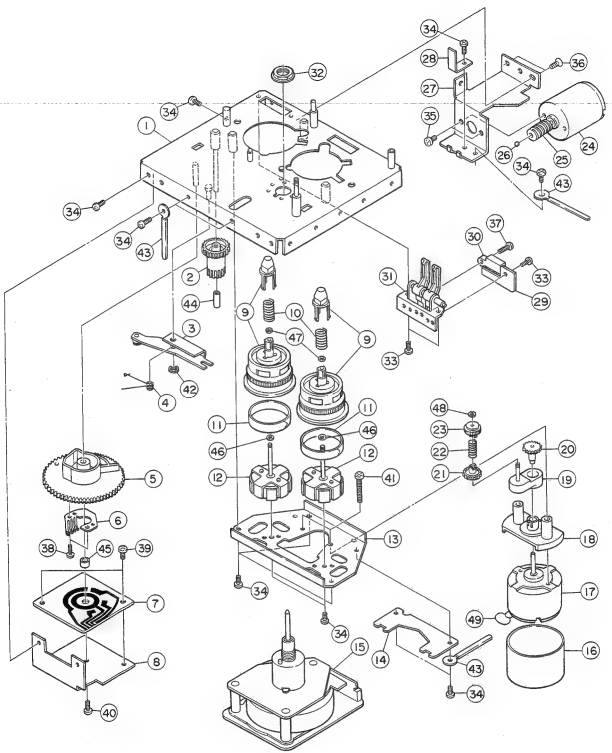


EXPLODED VIEW-3

Parts marked with *require longer delivery time.

REF.NO.	PART NO.	DESCRIPTION	REMARKS
3- 1	5801093500	HOLDER ASSY,CASSETTE	
	*5801093600	HOLDER SUB-ASSY,CASSETTE	
	*5581056000	SHAFT;A	
	*5800120100	ROLLER,GUIDE	
	*5534878000	RIVET,PUSH	
	*5801093800	ARM ASSY,HOLDER	
	*5786001500	E-RING;E-1.5	
3- 2	5800115403	SPRING,CASSETTE PRESSURE	
3- 3	5800109600	HOLDER;L	
3- 4	5800122100	HOLDER;R	
3- 5	*5801094200	SPRING,HOLDER	
3- 6	5378601700	HEAD,ERASE;8TR8CH	
3- 7	5800931300	SPRING,HEAD	
3- 8	5378601600	HEAD,R/P;8TR8CH	
3- 9	*5801091300	GUIDE,TAPE	
3-10	5801091200	SPRING,TAPE GIDE	
3-11	*5800595500	SPRING,PRESSURE	
3-12	*5800615400	SPRING,HEADA BASE	
3-13	*5540055000	STEEL BALL 20	
3-14	*5801090600	BASE ASSY,HEAD	
3-15	*5801090300	SLIDER ASSY	
3-16	5540056000	STEEL BALL 30	
3-17	5225018000	LED SLF325C-05	
3-18	*5801093400	PLATE,CASSETTE	
3-19	*5200251600	SENSOR PCB ASSY	Refer to pages 30 & 32
3-20	*5800616100	SPRING,BRAKE	
3-21	*5800620000	ARM ASSY,BRAKE;L	
3-22	*5800619900	ARM ASSY,BRAKE;R	
3-23	5801091400	PINCH ARM ASSY	
3-24	5800117400	GUIDE,CASSETTE	
3-25	5801090200	SPRING,CASSETE PRESSURE;F	
3-26	*5801095200	BRACKET ASSY;HOLDER;R	
3-27	*5801095500	PLATE,DAMPER	
3-28	5800642100	DAMPER ASSY	
3-29	*5801094300	BRACKET ASSY,HOLDER;L	
	*5801094400	BRACKET SUB-ASSY,HOLDER;L	
	*5801094800	SPRING,LOCK ARM	
	*5801094900	ARM,LOCK	
	*5801095100	ARM,EJECT	
	*5801095000	SPRING,EJECT ARM	
	*5786003000	E-RING;E-3	
3-30	*5800955800	SPRING,PINCH ROLLER;R	
3-31	*5780022004	SCREW,BINDING HEAD;(BLK NI)	
3-32	*5730029400	SCREW,PWA2*8FNI	
3-33	*5783002605	SCREW,PAN S-TITE;M2.6X5	
3-34	*5783032606	SCREW,BINDING S-TITE;M2.6X6	
3-35	*5786002000	E-RING;E-2	
3-36	*5781952000	NUT,NYLON;M2	
3-37	*5785313000	WASHER,POLIS.;3X6X0.5T	
3-38	*5785303100	WASHER,POLIS.;3X6X0.25T	
3-39	*5785331500	WASHER,POLIS.;1.5X4X0.5T	
3-40	*5786713400	CLIP,HARNESS;3.2X6.0X47	

EXPLODED VIEW – 4



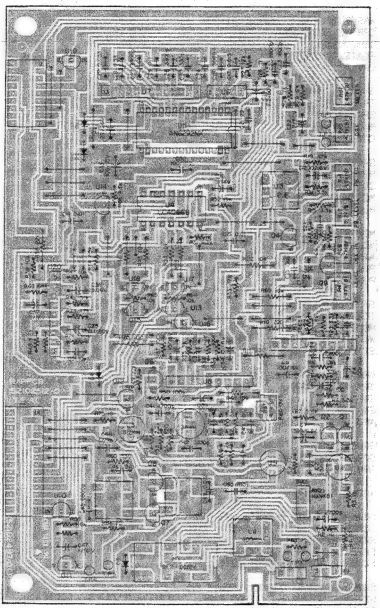
EXPLODED VIEW-4

Parts marked with *require longer delivery time.

REF.NO.	PART NO.	DESCRIPTION	REMARKS
4- 1		CHASSIS ASSY,MECHANISM	
4- 2	5801093000	GEAR,JOINT	
4- 3	5801092500	ARM ASSY,BASE	
	*5801092600	ARM SUB-ASSY,BASE	
	*5800425800	ROLLER	
	*5785331500	WASHER,POLIS.;1.5X4X0.5T CUT	
4- 4	*5801092400	SPRING,BASE ARM	
4- 5	5800737800	CAM,CONTROL	
4- 6	*5800595300	PLATE,CONTACT	
4- 7	*5210251800	CAM PCB	
4- 8	*5801092900	BRCKET,CAM PCB	
4- 9	5800731500	TABLE ASSY,REEL	
4-10	5800231300	SPRING,REEL	
4-11	5800236501	RING,DRIVE	
4-12	5801092000	COIL UNIT	
4-13	*5801091900	BRACKET,REEL	
4-14	*5210250900	MECHA JOINT PCB	
	5224016720	DIODE;1SR35-200A FT	
4-15	5370008300	MOTOR,CAPSTAN;DC	
4-16	*5800235900	PLATE,SHIELD	
4-17	5370002502	MOTOR,REEL;DC	
4-18	*5800732602	HOLDER,MOTOR	
4-19	5800461500	ARM ASSY,PULLEY	
4-20	5800736000	PULLEY,GEAR;A	
4-21	5800461600	PULLEY ASSY,GEAR;B	
4-22	5800430200	SPRING,PULLEY	
4-23	5800430302	IDLER ASSY	
4-24	5370008200	MOTOR,ASSIST;DC	
4-25	*5801093300	WORM	
4-26	5540056000	STEEL BALL 30	
4-27	*5801093100	BRACKET,ASSIST MOTOR	
4-28	*5801093200	SPRING,THRUST	
4-29	*5210251700	SW PCB	
4-30	5302107300	SWITCH,TAPE SELECTOR;SPPW62	
4-31	*5801091600	ARM ASSY,SWITCH	
	*5801091700	BRACKET,SWITCH ARM	
	*5785602050	SPACER,2.0X5.0MM	
	*5801091800	ARM,SWITCH	
	*5786372022	PIN,2X22	
4-32	*5730029100	NUT,FLANGE;M9X0.75X2.5	
4-33	*5783032003	SCREW,BINDING S-TITE;M2X8	
4-34	*5783002605	SCREW,PAN S-TITE;M2.6X5	
4-35	*5780003003	SCREW,BINDING;M3X3	
4-36	*5783042605	SCREW,FLAT S-TITE;M2.6X5	
4-37	*5783032006	SCREW,BINDING S-TITE;M2X6	
4-38	*5781112004	SCREW,BINDING TAPPING;M2X4	
4-39	*5783032605	SCREW,BINDING S-TITE;M2.6X5	
4-40	*5780002004	SCREW,BINDING HEAD;M2X4	
4-41	*5780002617	SCREW,BINDING HEAD;M2.6X17	
4-42	*5786002000	E-RING;E-2	
4-43	*5786713400	CLIP,HARNESS;3.2X6.0X47	
4-44	*5785602085	SPASER;2.0X8.5MM	
4-45	*5785604035	SPASER;4.0X3.5MM	
4-46	*5785301100	WASHER,POLIS.;1.5X4X0.25T	
4-47	*5785331100	WASHER,POLIS.;1.2X3.6X0.5T CUT	
4-48	*5785331500	WASHER,POLIS.;1.5X4X0.5T CUT	
4-49	*5173395000	C.,CERAMIC;0.047MF 50V	

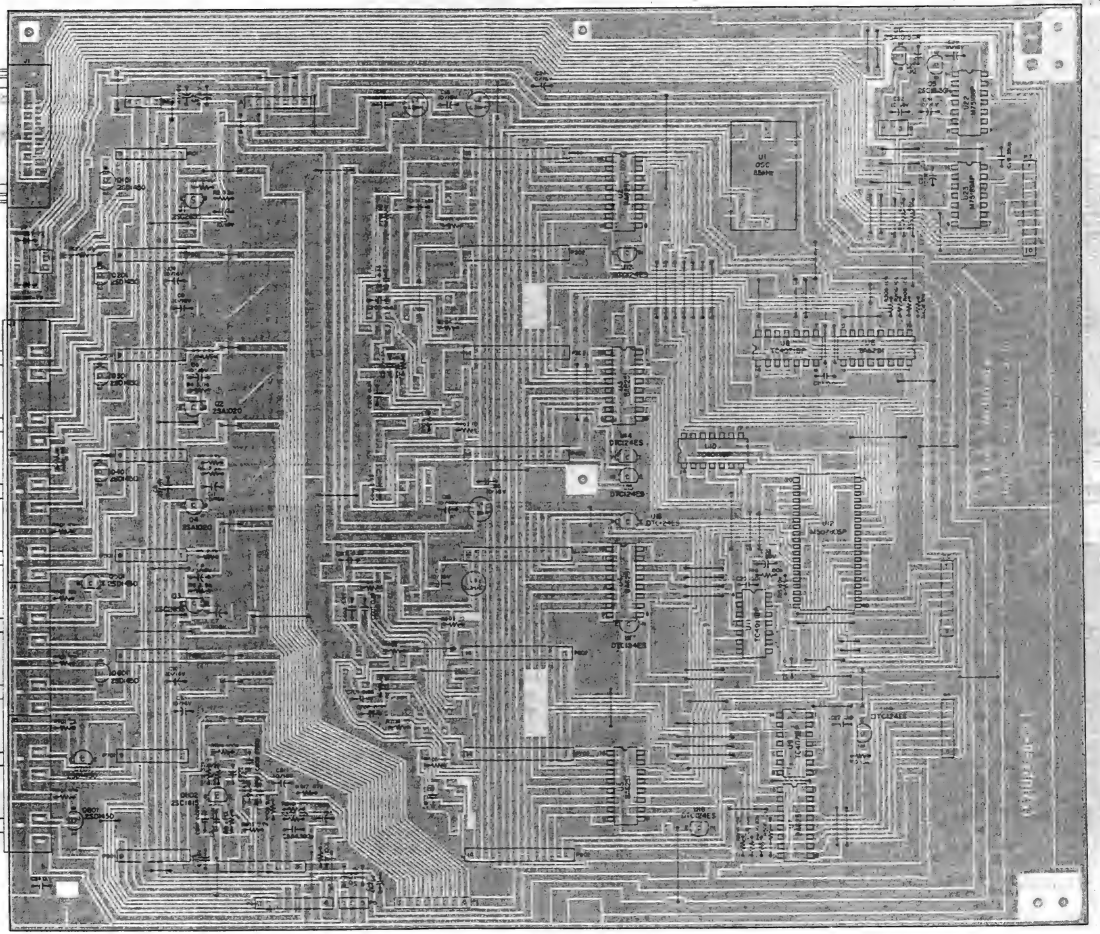
7. PC BOARDS AND PARTS LIST
基板図とパーツ・リスト

R/P AMP. PCB ASSY

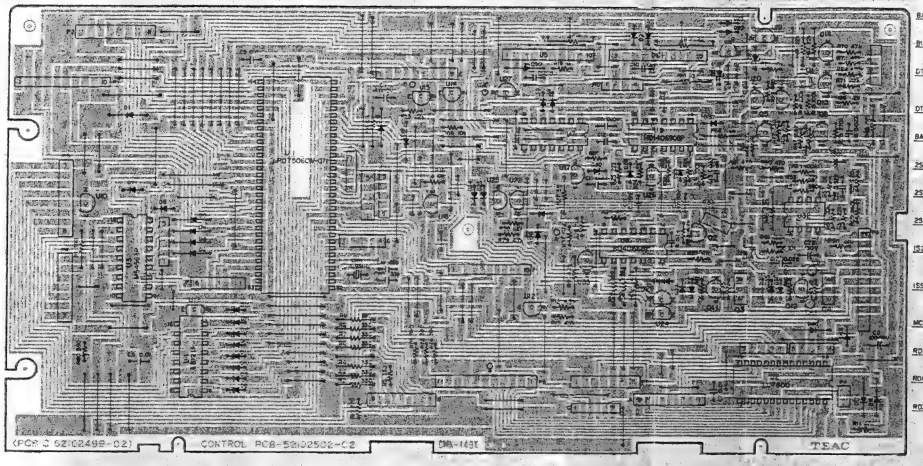


μPC4570 U2,U8,U20	2SC1644(F) Q1,Q2	1SS133 D1~D4
IB15-5002 U6	2SD1450 Q4,Q6,Q9	
DTA124ES U10,U12~U16 U19	2SC2002 Q7,Q8	
IB15-D002 U7		
DTC124ES U11,U17,U18		

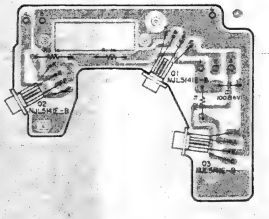
MOTHER PCB ASSY



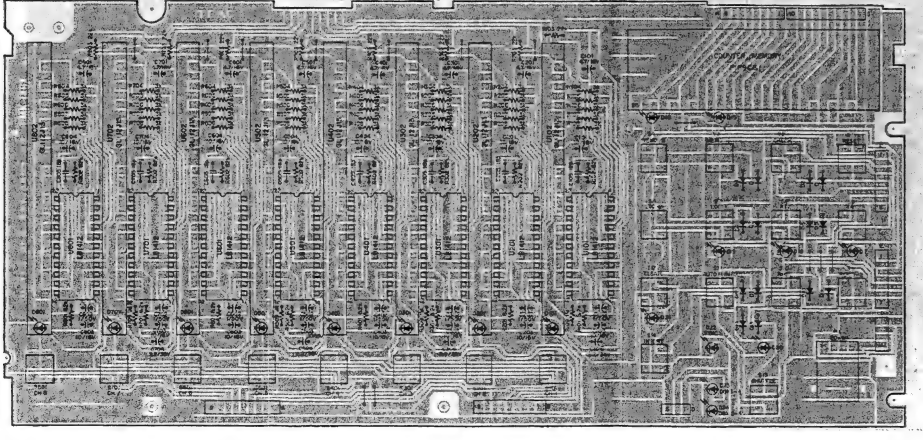
CONTROL PCB ASSY



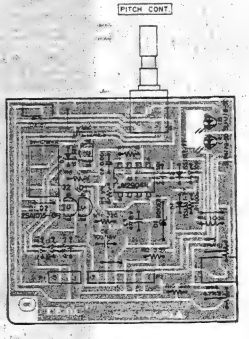
SENSOR PCB ASSY



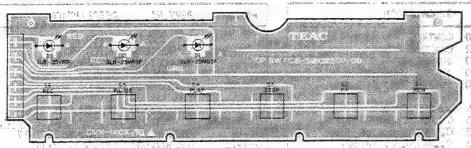
METER PCB ASSY



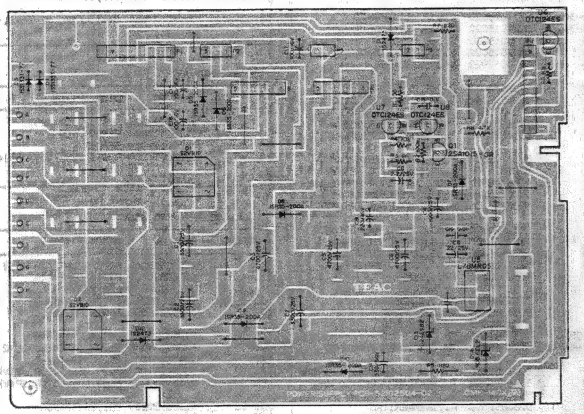
PITCH CONTROL PCB ASSY



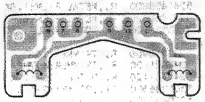
OPERATION SW PCB ASSY



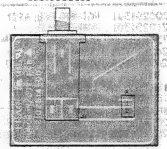
POWER SUPPLY PCB ASSY



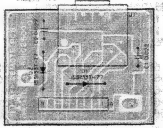
JOINT PCB ASSY



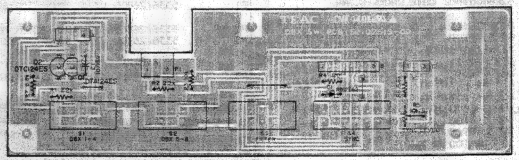
PUNCH IN/OUT PCB ASSY



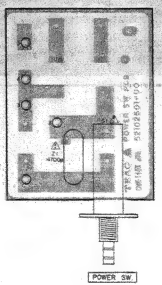
REMOTE PCB ASSY



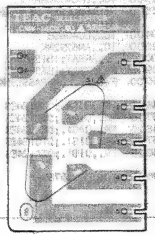
DBX SW PCB ASSY



POWER SW PCB ASSY



SELECTOR PCB ASSY [GE]



Parts marked with *require longer delivery time.

R/P AMP. PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200251201	R/P AMP PCB ASSY
	*5210251201	R/P AMP PCB
	5242117400	JUMPER,JPW-L5
	5242117500	JUMPER,JPW-L10
	5181765000	JUMPER,P=15.0
C9	5263167423	C.,METAL;0.039MF/50V
C17	5263166923	C.,METAL;0.015MF/50V
C24 C25	5263167923	C.,METAL;0.1MF/50V
C28	5263168523	C.,METAL;0.33UF 50V
C29	5263167323	C.,METAL;0.033UF 50V
C40	5263168323	C.,METAL;0.22UF 50V
C46	5263166723	C.,METAL;0.010UF 50V
C49	5263166823	C.,METAL 0.012UF 50V
DI -4	5224015020	DIODE,ISS133T77
JI	5336281900	SOCKET,CONNECTOR;9P
J2	5336282400	SOCKET,CONNECTOR;14P
KI	5290013800	RELAY,DF2-DC12V
LI	5286010200	COIL,CHOKE;36MH
L2	5286035700	COIL,SEMIFIXED;600UH
L3	5286008700	COIL,CHOKE;8.2MH
PI	5336128300	PLUG,CONNECTOR;3P(WHT)
P2	5336141300	PLUG,CONNECTOR;3P(WHT)
QI Q2	5145119000	TR.,2SC-1844F
Q4 Q6	5231762020	TR.,2SD1450S/T
Q7 Q8	5230782200	TR.,2SC2002L
Q9	5231762020	TR.,2SD1450S/T
RIO RII	△5183586000	R.,NONFLAMMABLE;220 OHM
R14 R30	5280036100	R.,TRIMMER;4.7KB
R17	5280035900	R.,TRIMMER;2.2KB
R47 R67	5280036700	R.,TRIMMER;47KB
R57	5280036100	R.,TRIMMER;4.7KB
R62	5280036900	R.,TRIMMER;100KB
R68	5280036700	R.,TRIMMER;47KB
RTI	5143128000	THERMISTOR,S5C-34
TI	5320035000	TRANS,INPUT
T2	5320035100	TRANS,OUTPUT
TPI-6	5544750000	PIN,CONBINATION
UI	5286035800	COIL,TRAP;85KHZ
U2 U8	5220439500	IC.,UPC4570HA
U3	5292803500	FILTER,LOWPASS;19KHZ
U4	5220419400	IC.,LC4066B
U5	5220432000	IC.,AN6292NK
U6	5242120000	R.,ARRAY;1B15-5002
U7	5242120900	R.,ARRAY;1B15-D002
U9	5292805000	FILTER,LOW PASS;85KHZ
UIO	5232254820	TR.,DIGI.;DTAI24ES
UII	5232255720	TR.,DIGI.;DTCI24ES
UI2 -16	5232254820	TR.,DIGI.;DTAI24ES
UI7 UI8	5232255720	TR.,DISI.;DTCI24ES
UI9	5232254820	TR.,DIGI.;DTAI24ES
U20	5220439500	IC.,UPC4570HA

MOTHER PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200251301	MOTHER PCB ASSY
	*5210251301	MOTHER PCB
	5730018100	CLIP,COATING;CP-1S
	5242117400	JUMPER,JPW-L5
	5242117500	JUMPER,JPW-L10
	5181765000	JUMPER,P=15.0
	5181767000	JUMPER,P=20.0
	5181769000	JUMPER,P=25.0
C101 C401	5263168523	C.,METAL;0.33UF 50V
C201 C301	5263168523	C.,METAL;0.33UF 50V
C202 C302	5263168523	C.,METAL;0.33UF 50V
C501 C801	5263168523	C.,METAL;0.33UF 50V
C601 C701	5263168523	C.,METAL;0.33UF 50V
C602 C702	5263168523	C.,METAL;0.33UF 50V
C806 C807	5263167123	C.,METAL;0.022UF 50V
DI D2	5224015020	DIODE,ISS133T-77
JI	5334055000	SOCKET,CONNECTOR;15P
J2-5	5330507200	JACK,PIN;4P
LI-4	5286006700	COIL,CHOKE;1.2MH
PI	5336126800	PLUG,CONNECTOR;8P(WHT)
P2 P6	5336126800	PLUG,CONNECTOR;8P(WHT)
P3	5336126300	PLUG,CONNECTOR;3P(WHT)
P4	5336126400	PLUG,CONNECTOR;4P(WHT)
P5	5336126600	PLUG,CONNECTOR;6P(WHT)
P7	5336127000	PLUG,CONNECTOR;10P(WHT)
P101-801	5336279900	PLUG,CONNECTOR;9P
P102-802	5336280400	PLUG,CONNECTOR;14P
Q1 Q3	5230773800	TR.,2SC2655-Y
Q2 Q4	5230014000	TR.,2SA1020-Y
Q5	5230779520	TR.,2SC-1815GR
Q6	5230012920	TR.,2SA1015GR
Q101-801	5231762020	TR.,2SD1450S/T
Q802	5230779520	TR.,2SC1815GR
SI	5302107500	SW,DIP;KSP02B
UI	5292204500	MODULE,OSC;85KHZ
U2-7	5232250900	TR.,ARRAY;BA6251
U8 U9	5220019500	IC.,TC4071BP
UIO UII	5220019100	IC.,TC4011BP
UI2	5220021100	IC.,M50780SP
UI3-19	5232255720	TR.,DIGI.;DTCI24ES
U22	5220062400	IC.,M75188P
U23	5220062700	IC.,M75189AP
U801	5220439500	IC.,UPC4570HA

Parts marked with *require longer delivery time.

CONTROL PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250200	CONTROL PCB ASSY
	*5210250202	CONTROL PCB
	5242117400	JUMPER,JPW-L5
	5242117500	JUMPER,JPW-L10
	5181765000	JUMPER,P=15.0
	5181763000	JUMPER,P=10.0
C9 C10	5263167923	C.,METAL;0.1MF 50V
CII	5263168323	C.,METAL;0.22UF 50V
CI2	5263167923	C.,METAL;0.1MF 50V
CI5	5263167323	C.,METAL;0.033UF 50V
CI6-18	5263167123	C.,METAL;0.022UF 50V
CRI	5347009900	RESONATOR,CERAMIC;KBR-4.91MHZ
DI-5	5224012920	DIODE,IS2473
D6-15	5224015020	DIODE,ISS133T-77
DI6-19	5224012920	DIODE,IS2473
D20-30	5224015020	DIODE,ISS133T-77
D33-39	5224015020	DIODE,ISS133T-77
D40	5224015220	DIODE,MC921
D45	5224015020	DIODE,ISS133T-77
D46	5224012920	DIODE,IS2473
D50	5224574401	DIODE,ZENER;RD7.5EL2
D51	5224572001	DIODE,ZENER;RD3.3EL2
D52	5224573801	DIODE,ZENER;RD6.2EL2
PI	5336127000	PLUG,CONNECTOR;10P(WHT)
P2	5336126800	PLUG,CONNECTOR;8P(WHT)
P3	5336126800	PLUG,CONNECTOR;8P(WHT)
P4	5336126700	PLUG,CONNECTOR;7P(WHT)
P5	5336146100	PLUG,CONNECTOR;11P(YEL)
P6	5336126200	PLUG,CONNECTOR;2P(WHT)
P7	5336126700	PLUG,CONNECTOR;7P(WHT)
P8	5336127100	PLUG,CONNECTOR;11P(WHT)
P9	5336126400	PLUG,CONNECTOR;4P(WHT)
PIO	5336126400	PLUG,CONNECTOR;4P(WHT)
PII	5336126500	PLUG,CONNECTOR;5P(WHT)
QI	5232008400	FET.,2SK381D
Q2	5232008400	FET.,2SK381D
Q3	5231763000	TR.,2SD1380R
Q4	5231763000	TR.,2SD1380R
Q5 Q8	5230780920	TR.,2SC2603F
QII-14	5230780920	TR.,2SC2603F
RI7	△5241283710	R.,NONFLAMMABLE;2W 22 OHM
RI8	△5181950000	R.,NONFLAMMABLE;1.0 OHM
R20	△5241282910	R.,NONFLAMMABLE;2W 10 OHM
R33	5280035700	R.,TRIMMER;1KB
TPI TP2	5544750000	PIN,CONBINATION
UI	5220813500	IC.,UPD75206CW-071
U2	5220019700	IC.,LC7800
U3	5220065100	IC.,M54563P
U4	5220063200	IC.,LBI213
U5	5220427800	IC.,BA6209
U6	5220427800	IC.,BA6209
U7	5220055600	IC.,BU4081B
U8	5220041100	IC.,BU4066B
U9	5220017200	IC.,HDI4069UBP
UIO-15	5232255720	TR.,DIGI.;DTCI24ES
UI7-26	5232255720	TR.,DIGI.;DTCI24ES
U27	5232257400	TR.,DIGI.;DTBII3EA
U28-31	5242111300	R.,ARRAY;10KX4
U32	5220426300	IC.,BA6993
U33	5232255720	TR.,DIGI.;DTCI24ES

METER PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250300	METER PCB ASSY
	*5210250300	METER PCB
	5801087400	SPACER,METER
	5347010000	TUBE,FL;FIP9G6
	5242117400	JUMPER,JPW-L5
	5801098300	SPACER,LED
C105-805	12906819	C.,TUBULAR CERAMIC;RH050
DI-14	5224015020	DIODE,ISS133T-77
D15-22	5225021500	LED,SLP177B-60
D23 D24	5225021600	LED,SLP277B-50
DI01-801	5225021100	LED,GL8HD22
RI	5282018800	R.,TRIMMER;20KW.
SI-14	5302107400	SW,TACT;KSHHAL
S101-801	5302107400	SW,TACT;KSHHAL
UI01-801	5220439400	IC.,LBI412
UI02-802	5296007700	UNIT,LEVEL METER;GL-112JI3

SENSOR PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250900	SENSOR PCB ASSY
	*5210250900	SENSOR PCB
	5800739900	SPACER
QI -3	5228013100	PHOTO REFLEC.;NJL5141EA-B

PITCH CONTROL PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250500	PITCH CONT PCB ASSY
	*5210250500	PITCH CONT PCB
	*5210250600	LED PCB
DI-3	5224015020	DIODE,ISS133T77
D4	5225021700	LED,SLP477B-50
D5	5225021500	LED,SLP177B-50
D6	5224542401	DIODE,ZENER;RDI0EB2
KI	5290013700	RELAY,SY-12W-K
PI	5336128700	PLUG,CONNECTOR,7P(WHT)
P2	5336128300	PLUG,CONNECTOR,3P(WHT)
QI Q2	5230012920	TR.,2SA1015GR
R3	5241460620	R.,METAL FILM;10K
R4	5241463020	R.,METAL FILM;100K
R5	5280182100	R.,TRIMMER;47KB H.METAL
R6	5241462920	R.,METAL FILM;91K
R7	5241459420	R.,METAL FILM;3.3K
R8	5241458620	R.,METAL FILM;1.5K
R9	5241458820	R.,METAL FILM;1.8K
RIO	5241460220	R.,METAL FILM;6.8K
RII	△5183586000	R.,NONFLAMABLE;220 OHM
RI3	5282018900	R.,TRIMMER;10KB
RI4	5280021100	R.,TRIMMER;4.7KB
RI5	5241461420	R.,METAL FILM;22K
SI	5301206300	SW.,ROTARY;2-3 N
UI	5220407200	IC.,LM2904
U2	5232255720	TR.,DIGI.;DTCI24ES

Parts marked with *require longer delivery time.

OPERATION SW PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250700	OP SW PCB ASSY
	*5210250700	OP SW PCB
	5302107400	SW,TACT;KSHHAL

PUNCH IN/OUT PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200251400	PUNCH IN/OUT PCB ASSY
	*5210251400	PUNCH IN/OUT PCB
	5330014800	JUCK,SINGLE;YKB21-5014
	5317003300	NUT

POWER SUPPLY PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250400	POWER SUPPLY PCB ASSY [J,US,C,GE]
	*5200250410	POWER SUPPLY PCB ASSY [E,UK,A]
	*5210250402	POWER SUPPLY PCB
	*5210250800	JOINT PCB
	5783033005	SCREW,BINDING S-TITE;M3X5
	5332015800	HOLDER,FUSE [E,UK,A]
	5555590000	PLATE,PCB EARTH;A
	5800990100	HEAT SINK
	5783033005	SCREW,BINDING S-TITE;M3X5
	5181761000	JUMPER,P=5.0
	5181763000	JUMPER,P=10.0
C1 C2	△5260427710	C.,ELEC.;3300/25V
C3	△5260428210	C.,ELEC.;4700/25V
C5 C6	△5260428210	C.,ELEC.;4700/25V
C7	△5260427710	C.,ELEC.;3300/25V
C11	5263167923	C.,METAL;0.1MF/50V
C18	5263167923	C.,METAL;0.1MF/50V
D1	△5228010800	SILICON STACK,S2VB10
D2	△5228010800	SILICON STACK,S2VB10
D3 D4	5224015020	DIODE,1SS133T77
D5-7	5224016720	DIODE,ISR35-200A
D8 D9	△5224016720	DIODE,ISR35-200A
D10	5224016720	DIODE,ISR35-200A
D11	5224012920	DIODE,1S2473
D12	5224012920	DIODE,1S2473
D13	5224591421	DIODE,ZENER;RD 24ESB2
D14	5224573501	DIODE,ZENER;RD5.6EL2
F1 F2	△5041140000	FUSE,MINI;T1A/250V [E,UK,A]
F3	△5142188000	FUSE,MINI;T1.6A/250V [E,UK,A]
P1	5336126700	PLUG,CONNECTOR;7P(WHT)
P2	5336126300	PLUG,CONNECTOR;3P(WHT)
P3	5336126200	PLUG,CONNECTOR;2P(WHT)
P4	5336126900	PLUG,CONNECTOR;9P(WHT)
P5	5336135200	PLUG,CONNECTOR;2P(RED)
Q1	5230012920	TR.;2SA1015GR
R5	△5183600000	R.,NONFLAMABLE;820 OHM
U1	△5220434800	IC.,M5F7812L
U2	△5220435700	IC.,M5F7912L
U3	△5220434800	IC.,M5F7812L
U4	△5220434800	IC.,M5F7812L
U5	△5220430300	IC.,L78MR05
U6	5232255720	TR.,DIGI.;DTC124ES
U7	5232255720	TR.,DIGI.;DTC124ES
U8	5232255720	TR.,DIGI.;DTC124ES

[J]:JAPAN [US]:U.S.A. [E]:EUROPE
[GE]:GENERAL EXPORT [C]:CANADA
[A]:AUSTRALIA [UK]:U.K.

REMOTE PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200250000	REMOTE PCB ASSY
	*5210250001	REMOTE PCB
	5334045400	SOCKET,DIN;8P
D1 D2	5224012920	DIODE,1S2473

DBX SW PCB ASSY

REF.NO.	PART NO.	DESCRIPTION
	*5200251500	DBX SW PCB ASSY
	*5210251500	DBX SW PCB
	5242117400	JUMPER,JPW-L5
	5242117500	JUMPER,JPW-L10
D1	5224543101	DIODE,ZENER;RD12EB2
P1	5336128300	PLUG,CONNECTOR;3P(WHT)
R5	5280021304	R.,TRIMMER;10KB
S1-3	5300913000	SW.,SLIDE;2-2 SSSU
S4	5300916200	SW.,SLIDE;4-2 N SSSU
U1	5232254820	TR.,DIGI.;DTA124ES
U2	5232255720	TR.,DIGI.;DTC124ES

POWER SW PCB ASSY

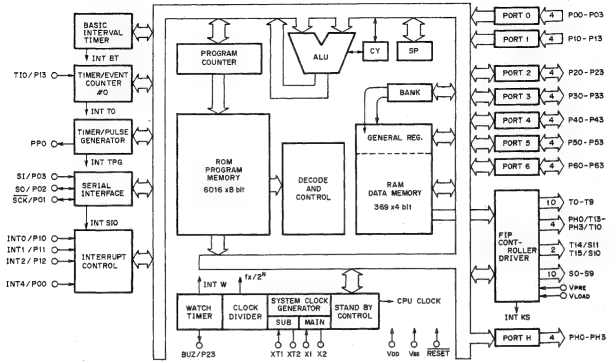
REF.NO.	PART NO.	DESCRIPTION
	*5200250100	POWER SW PCB ASSY [J,US,C,GE]
	*5200250110	POWER SW PCB ASSY [E,UK,A]
	*5210250100	POWER SW PCB
	5730007500	COVER,CAPASITOR;SB-1417 [E,UK,A]
	5327007200	TERMINAL,2P [E,UK,A]
S1	△5300046200	SW.,PUSH;1-1 SDDLDI
Z1	△5267703800	SPARK KILLER,4700PF 400V

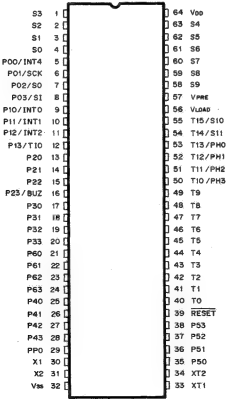
SELECTOR PCB ASSY [GE]

REF.NO.	PART NO.	DESCRIPTION
	*5200251900	SELECTOR PCB ASSY
	*5210251900	SELECTOR PCB
	△5302101700	SW.,VOLTAGE SELECT;FS907G

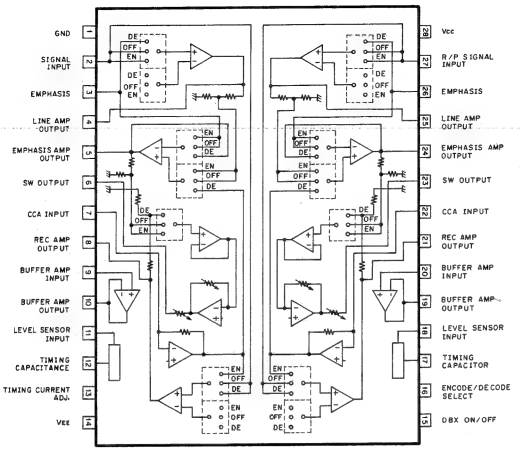
8. IC BLOCK DIAGRAMS
ICブロック・ダイアグラム

μPD75206CW-071

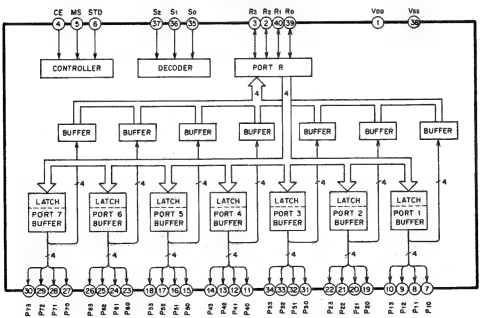




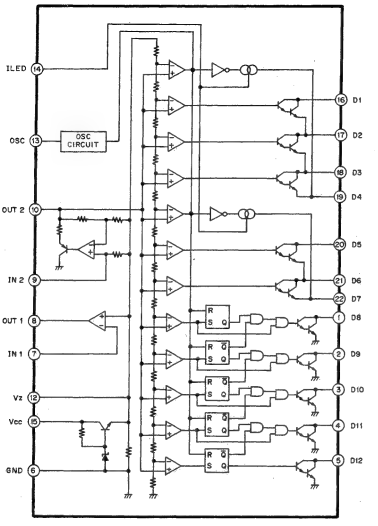
AN6292NK



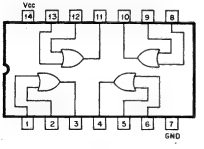
M50780SP



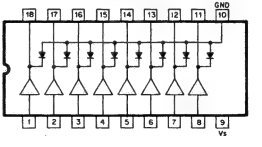
LB1412



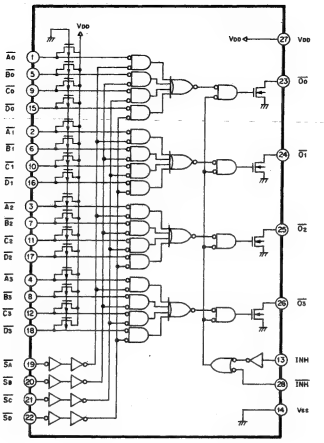
TC4071BP



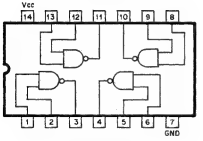
M54563P



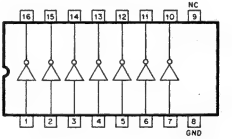
LC7800



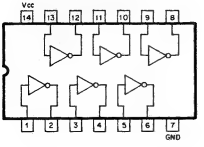
TC4011BP



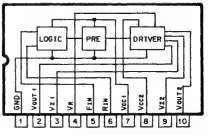
BA6251



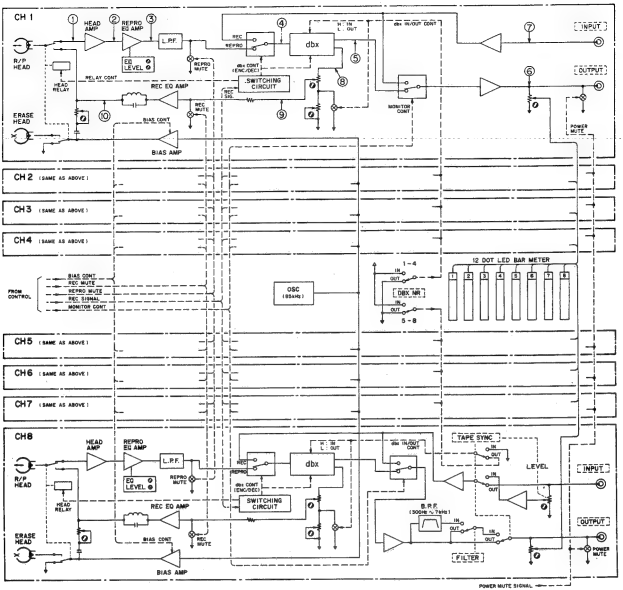
HD14069UBP

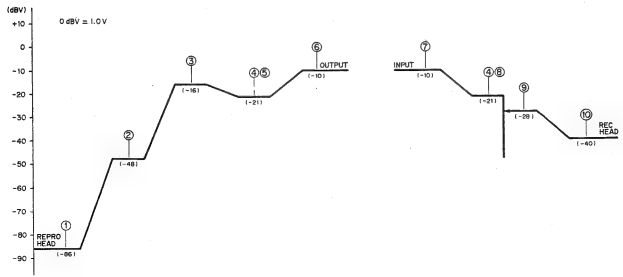


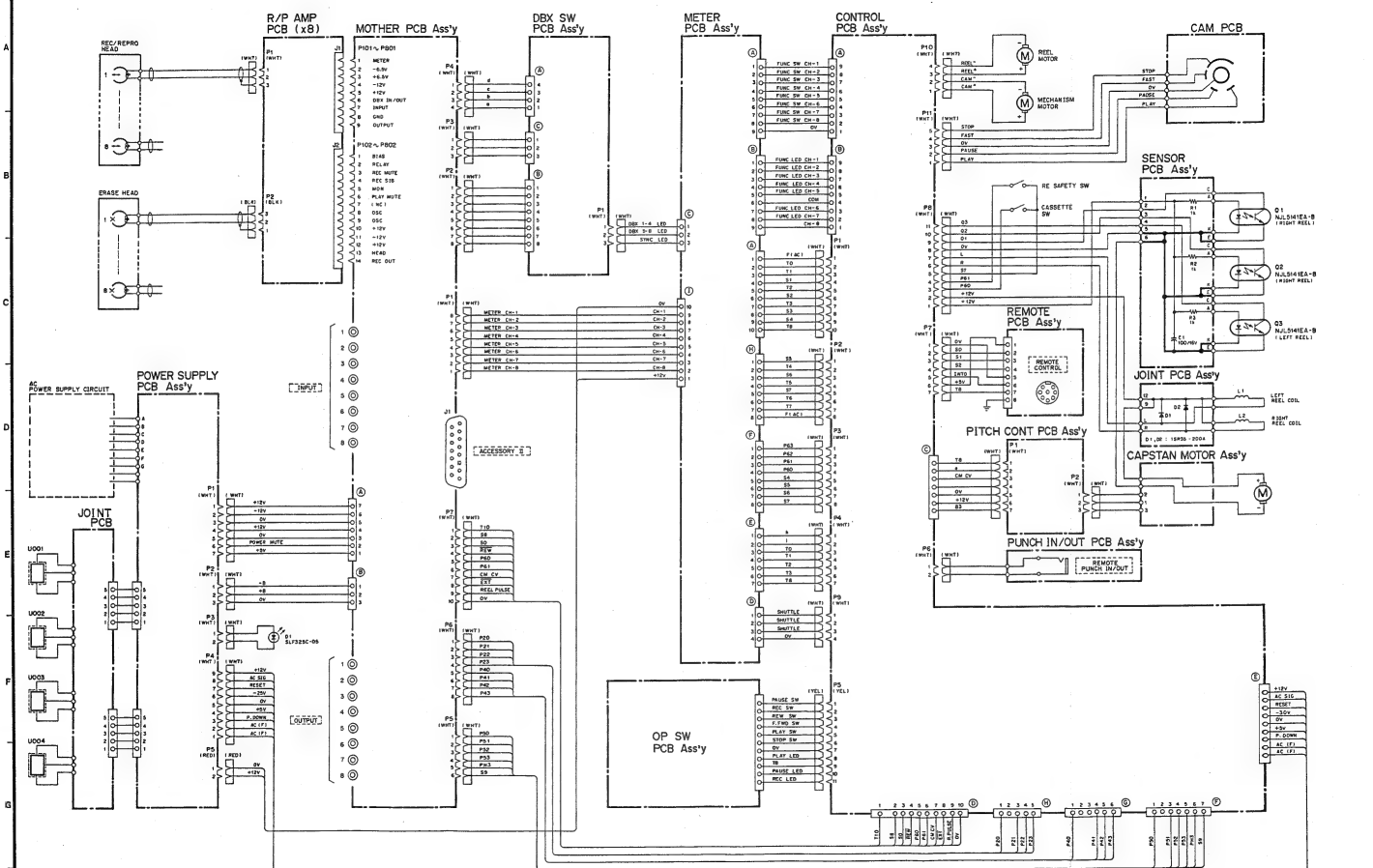
BA6209

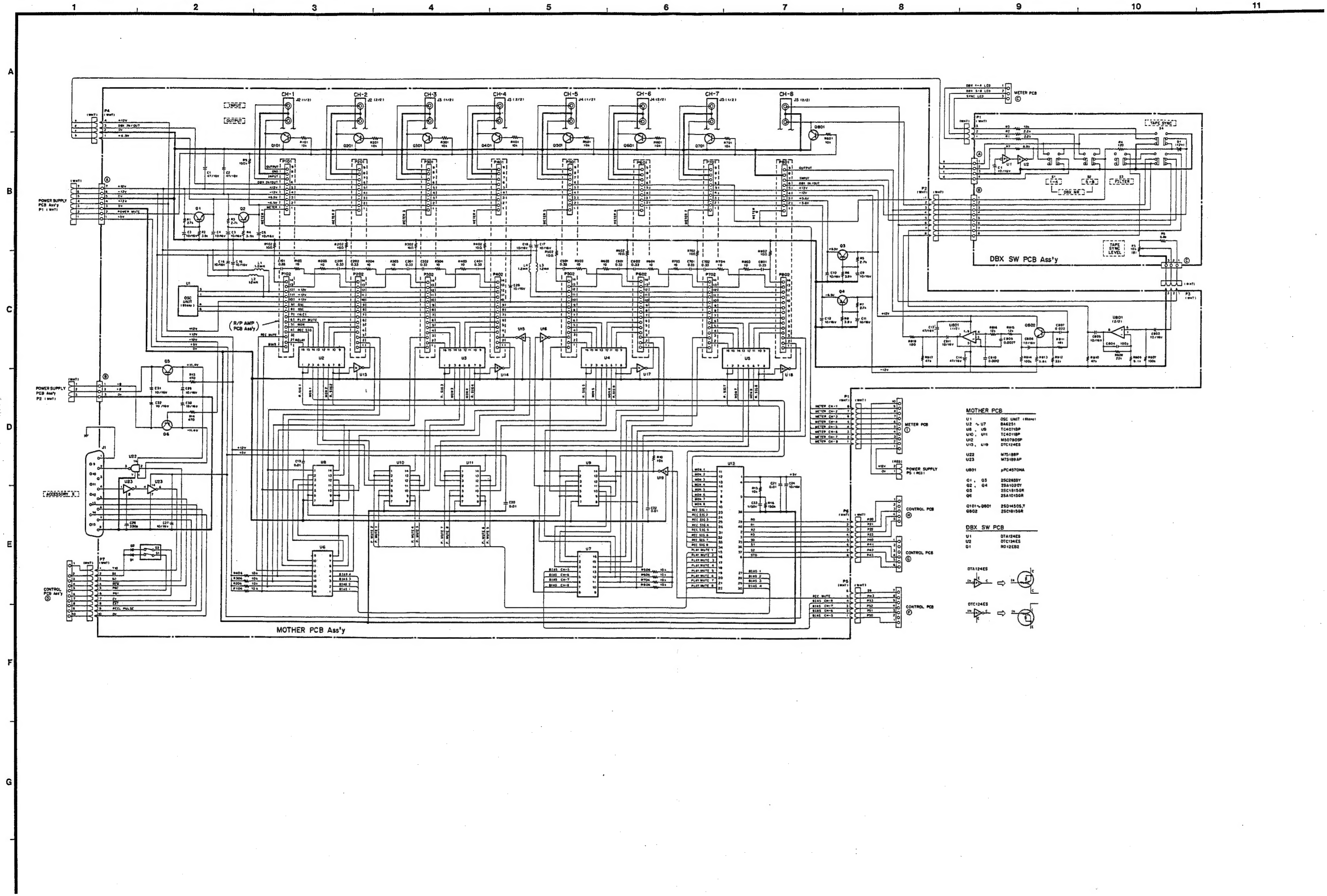


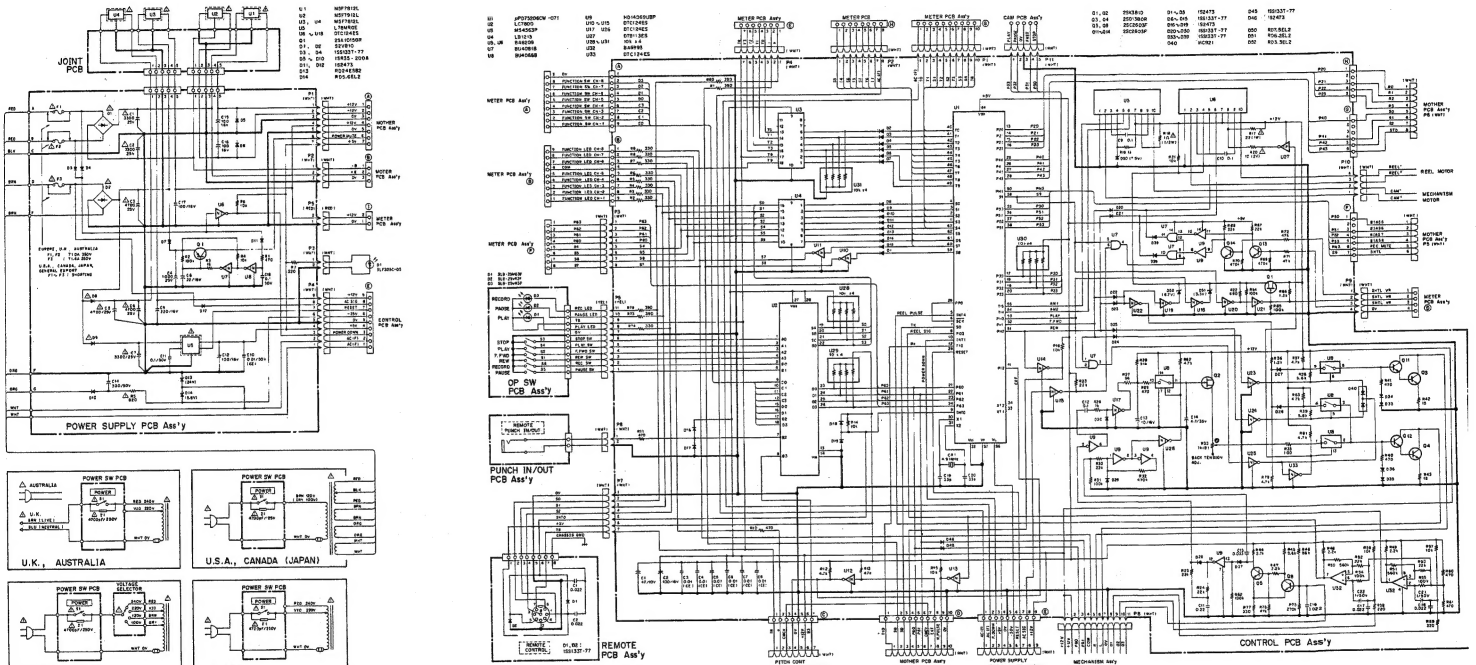
9. BLOCK AND LEVEL DIAGRAM
ブロック・レベル・ダイアグラム

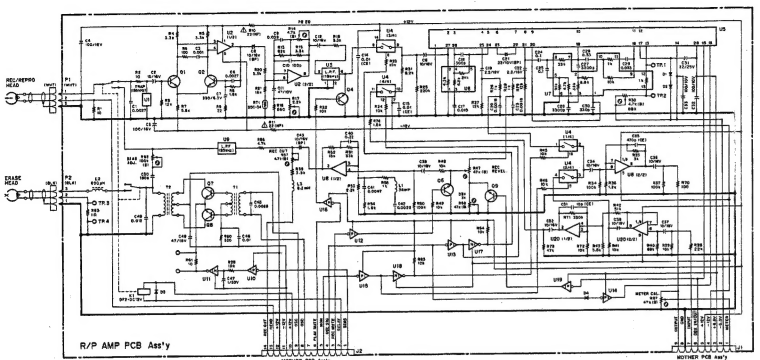




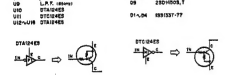

R/P AMP PCB (x8)
MOTHER PCB Ass'y
DBX SW PCB Ass'y
METER PCB Ass'y
CONTROL PCB Ass'y
CAM PCB
SENSOR PCB Ass'y
REMOTE PCB Ass'y
JOINT PCB Ass'y
PITCH CONT PCB Ass'y
CAPSTAN MOTOR Ass'y
PUNCH IN/OUT PCB Ass'y
POWER SUPPLY PCB Ass'y
JOINT PCB
OP SW PCB Ass'y
REC/REPRO HEAD
ERASE HEAD
REEL MOTOR
MECHANISM MOTOR
RE SAFETY SW
CASSETTE SW
AC POWER SUPPLY CIRCUIT

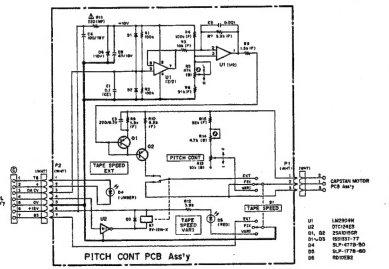

MOTHER PCB Ass'y
DBX SW PCB Ass'y
CH-1
CH-2
CH-3
CH-4
CH-5
CH-6
CH-7
CH-8
POWER SUPPLY PCB Ass'y P1
POWER SUPPLY PCB Ass'y P2
CONTROL PCB Ass'y
METER PCB
TAPE SYNC
DBX NR
FILTER
MOTHER PCB
U1 OSC UNIT
U2 ~ U7 BA6251
U8 , U9 TC4071BP
U10 , U11 TC4011BP
U12 M50780SP
U13 , U19 DTC124ES
U22 M75188P
U23 M75189AP
U801 μPC4570HA
Q1 , Q3 2SC2655Y
Q2 , Q4 2SA1020Y
Q5 2SC1815GR
Q6 2SA1015GR
Q101 ~ Q801 2SD1450S,T
Q802 2SC1815GR
DBX SW PCB
U1 DTA124ES
U2 DTC124ES
D1 RD12EB2
DTA124ES
DTC124ES


JOINT PCB
POWER SUPPLY PCB Ass'y
U.K., AUSTRALIA
U.S.A., CANADA (JAPAN)
GENERAL EXPORT
EUROPE
OP SW PCB Ass'y
PUNCH IN/OUT PCB Ass'y
REMOTE PCB Ass'y
CONTROL PCB Ass'y
REEL MOTOR
MECHANISM MOTOR

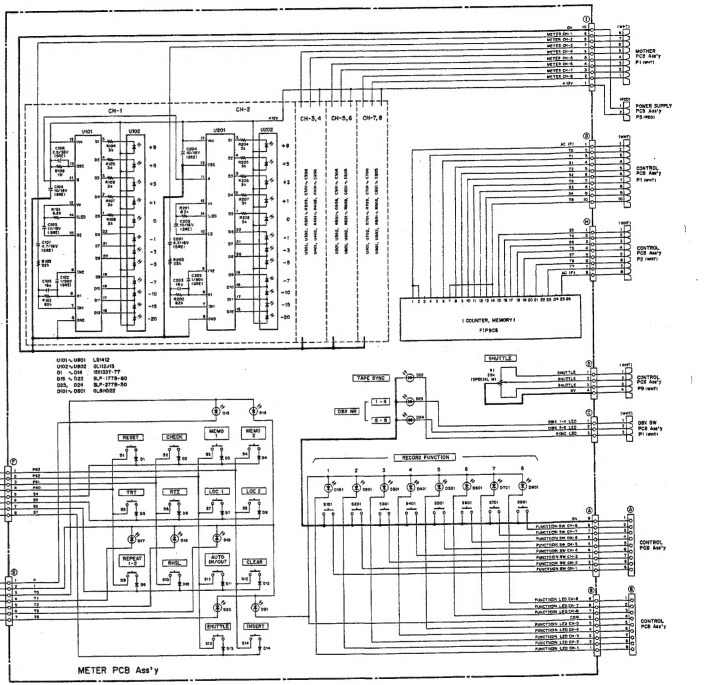


U1	TRAP COIL (180nH)	U17, U18	DTC124ES
U2	μPC4570NA	U19	DTA124ES
U3	L.P.F. (68kHz)	U20	μPC4570NA
U4	NJM2068M		
U5	MN6299NK	Q1, Q2	2SC9447
U6	IS6-5002 (RESISTOR ARRAY)	Q4	2SD1405LT
U7	IS6-5002 (RESISTOR ARRAY)	Q6	2SD1405LT
U8	μPC4570NA	Q7, Q8	2SC5003L
U9	L.P.F. (68kHz)	Q9	2SD1405LT
U10	DTA124ES		
U11	DTC124ES	D1~D4	RB521S7-77
U12~U16	DTA124ES		





U1	LM2904M
U2	DTC124ES
Q1, Q2	2SA1037K
D1~D3	RB521S-77
D4	SLR-2ZT3-5D
D5	SLR-2ZT3-4D
D6	RD10EB2



U101 ~ U801	LS1412
U102 ~ U802	GL1G2T3
D1 ~ D16	RB521S-77
D19 ~ D22	SLR-2ZT3-5D
D23, D24	SLR-2ZT3-5D
D101 ~ D801	GL4H02E

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